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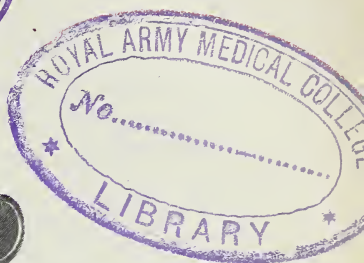


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BADGE OF THE ST. PAUL MEETING.



John Rank Hoff
Major, Surgeon U.S. Army.



PROCEEDINGS
OF
THE ASSOCIATION OF
Military Surgeons
OF
THE UNITED STATES

AT ITS TENTH ANNUAL MEETING HELD
AT SAINT PAUL, MINNESOTA
MAY 30, 31 AND JUNE 1, 1901



CARLISLE, PENNSYLVANIA
THE ASSOCIATION OF MILITARY SURGEONS
1901

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Association of Military Surgeons of the United States.

ELEVENTH ANNUAL MEETING.

WASHINGTON, D. C.

JUNE 5, 6 AND 7, 1902.

Officers and Committees.
1901-1902.

OFFICERS.

(EX-OFFICIO MEMBERS OF THE EXECUTIVE COMMITTEE.)

President.

LIEUTENANT COLONEL JOHN VAN R. HOFF,
CHIEF SURGEON, U. S. V.; MAJOR, SURGEON, U. S. ARMY.
WAR DEPARTMENT, WASHINGTON, D. C.

First Vice President.

BRIGADIER GENERAL ROBERT A. BLOOD,
SURGEON GENERAL OF MASSACHUSETTS,
CHARLESTOWN, MASS.

Second Vice President.

SURGEON GENERAL WALTER WYMAN,
UNITED STATES MARINE HOSPITAL SERVICE,
WASHINGTON, D. C.

Secretary.

MAJOR JAMES EVELYN PILCHER,
BRIGADE SURGEON, U. S. V.; CAPTAIN, RETIRED, U. S. ARMY.
CARLISLE, PENNSYLVANIA.

Treasurer.

LIEUTENANT HERBERT A. ARNOLD,
ASSISTANT SURGEON, PENNSYLVANIA, N. G.
ARDMORE, PENNSYLVANIA.

(3)

Standing Committees.

Executive Committee.

THE OFFICERS. *Ex Officio*, AND

Lieutenant Colonel GEORGE RYERSON FOWLER,
Brigade Surgeon, N. G. N. Y.

Lieutenant Colonel BENJAMIN FRANKLIN POPE,
Deputy Surgeon General, U. S. A.

Medical Inspector (Commander) PRESLEY MARION RIXEY,
United States Navy.

Lieutenant Colonel CHARLES F. W. MYERS,
Medical Director, N. J. N. G.

Lieutenant Colonel HENRY McI. W. MOORE,
Chief Surgeon, O. N. G.

AND THE EX-PRESIDENTS, *Ex Officio*, VIZ.:

Colonel NICHOLAS SENN,
Surgeon General Illinois N. G.

Brigadier General GEORGE M. STERNBERG,
Surgeon General, United States Army.

Medical Director (Commodore, Retired) ALBERT LEARY GIHON,
United States Navy.

Brigadier General JEFFERSON DAVIS GRIFFITH,
Surgeon General, Retired, N. G. Mo.

Colonel CHARLES HENRY ALDEN,
Assistant Surgeon General, Retired, U. S. A.

Brigadier General ALEXANDER J. STONE,
Surgeon General Minn. N. G.

Publication Committee.

Major JAMES EVELYN PILCHER,
Brigade Surgeon U. S. V. ; Captain Retired, U. S. A. ,
CARLISLE, PENNSYLVANIA.

Lieutenant Colonel CHARLES ADAMS,
Assistant Surgeon General, Ill. N. G.

Lieutenant ANGELO FESTORAZZI,
Assistant Surgeon, S. T. Ala.

Literary Committee.

Colonel CHARLES H. ALDEN,
Assistant Surgeon General, Retired, U. S. Army.
NEWTONVILLE, MASS.

Colonel WILLIAM WEST GRANT,
Surgeon General of Colorado.

Colonel WILLIAM DANIEL MCCARTHY,
Chief Surgeon of Division, N. G. Cal.

Lieutenant Colonel JOSEPH K. WEAVER,
Chief Surgeon of Division, N. G. Pa.

Surgeon (Lt.) FRANCIS WILLIAM FERDINAND WIEBER,
United States Navy.

Surgeon GEORGE TULLY VAUGHAN,
United States Marine Hospital Service.

Captain MYLES STANDISH,
Ambulance Corps, M. V. M.

Nominating Committee.

To be selected at the next Annual Meeting.

Special Committees.

Sander Prize Committee.

Honorable WILLIAM CARY SANGER,
Assistant Secretary of War.

Major General WESLEY MERRITT,
U. S. Army, Retired.

Brigadier General GEORGE MILLER STERNBERG,
Surgeon General U. S. Army.

Necrology Committee.

Medical Director (Captain) GEORGE PERLEY BRADLEY,
United States Navy.

Lieutenant Colonel LEONARD BALLOU ALMY,
Medical Director, Retired, Conn. N. G.

Major JOHN STEWART KULP,
Surgeon, U. S. V.; Capt. and Asst. Surg., U. S. A.

Post Exchange Committee.

Brigadier General GEORGE COOK,
Surgeon General Retired, of New Hampshire.
16 CENTRE ST., CONCORD, N. H.

Brigadier General JEFFERSON DAVIS GRIFFITH,
Surgeon General, Retired, of Missouri.

Colonel JAMES TAGGART PRIESTLEY,
Surgeon General of Iowa.

Colonel ROBERT HARVEY REED,
Surgeon General of Wyoming.

Major THOMAS CHALMERS CLARK,
Surgeon Minn. N. G.

Major LOUIS LIVINGSTON SEAMAN,
Surgeon U. S. V. E.

Major ARTHUR LEE WRIGHT,
Surgeon N. G. Ia.

Transportation Committee.

Major ALBERT HENRY BRIGGS,
Surgeon N. G. N. Y.
267 HUDSON ST., BUFFALO, N. Y.

Auditing Committee.

To be appointed at the next Annual Meeting.

Committee of Arrangements for the Eleventh Annual Meeting.

(So far as completed at date of publication.)

Major GEORGE HENDERSON,
Surgeon General, N. G. D. C.
817 T ST., N. W., WASHINGTON, D. C.

Major LOUIS A. LAGARDE,
Surgeon United States Army.

Surgeon (Lt. Comdr.) SAMUEL H. DICKSON,
United States Navy.

Major WILLIAM C. BORDEN,
Surgeon United States Army.

Dr. GEORGE M. KOBER,
Professor in Columbian University.

Captain EDWARD L. MUNSON,
Assistant Surgeon, United States Army.

Constitution and By-Laws.

Revised June 1, 1901.

PREAMBLE.

The Military Surgeons of the United States, in order to promote and improve the science of Military Surgery, have associated themselves together and adopted the following Constitution and By-Laws:

CONSTITUTION.

ARTICLE I.

NAME.

The organization shall be known as "The Association of Military Surgeons of the United States."

ARTICLE II.

MEMBERS.

SECTION 1. There shall be Active, Associate, Honorary, Corresponding, and Life Members.

ACTIVE MEMBERS.

SECTION 2. Commissioned medical officers of the United States Army, of the Navy, of the Marine Hospital Service, of the National Guard or Volunteer Militia of the several States, of the United States Volunteers and acting assistant or contract surgeons of the United States Army, are eligible for active membership. Active members may retain their membership should they be honorably discharged from the service in which they were commissioned. Active members only shall be eligible for office or entitled to vote.

ASSOCIATE MEMBERS.

SECTION 3. Ex-medical officers and other officers of either of the above-mentioned services, and of the Marine Hospital Service, ex-medical officers of the United States Volunteer Service, and ex-medical officers of the Confederate Army and Navy, whose service was honorably terminated, are eligible for associate membership.

HONORARY MEMBERS.

SECTION 4. Persons who are not qualified for active membership, but who have achieved distinction in the military service, are eligible as honorary members.

CORRESPONDING MEMBERS.

SECTION 5. Military Surgeons living outside of the United States who are prominent in the literature of military medicine and hygiene, are eligible as corresponding members.

LIFE MEMBERS.

SECTION 6. On payment of the sum of Fifty Dollars any active member may become a life member and be exempt from further dues.

ARTICLE III.

OFFICERS AND STANDING COMMITTEES.

OFFICERS.

SECTION 1. The officers shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold their respective offices until their successors are elected and qualified.

STANDING COMMITTEES.

SECTION 2. There shall be the following Standing Committees:

An Executive Committee, to consist of the officers and ex-presidents, and five (5) members.

A Publication Committee, to consist of three (3) members, one of whom shall be the Secretary as *ex-officio* Chairman.

A Literary Committee, to consist of seven (7) members,—four (4) members from the National Guard, State Troops or Militia, and one (1) each from the Army, Navy and Marine Hospital Service.

A Nominating Committee, based upon a representative or

one vote for each State, Territory, the Army, the Navy and the Marine Hospital Service, and for every additional ten (10) members or major fraction thereof an extra representative or vote; said vote or votes to be cast by a member or members, present from each State, Territory, Army, Navy and Marine Hospital Service, to be designated by the members present from each State, Territory, Army, Navy and Marine Hospital Service at the time of meeting.

ARTICLE IV.

QUORUM.

Thirty-five (35) members shall constitute a quorum for the transaction of business, but a less number may adjourn.

ARTICLE V.

AMENDMENTS.

All amendments to this Constitution and By-Laws shall be proposed in writing at one annual meeting, and voted on at the next. A three-fourths vote of all the members present at the annual meeting shall be necessary for adoption.

BY-LAWS.

ARTICLE I.

ELECTION TO MEMBERSHIP.

SECTION 1. Election to active or associate membership shall be by the Executive Committee, to whom the Secretary shall refer all applications, together with such credentials as may be presented.

SECTION 2. Election to honorary or corresponding membership shall be by a two-thirds vote of the Association, after the unanimous recommendation of the Executive Committee.

ARTICLE II.

EXPULSION FROM MEMBERSHIP.

Any member who may be dismissed from the service for conduct unbecoming an officer and a gentleman shall be expelled and debarred from any further rights or privileges when proper proof has been furnished the Secretary.

ARTICLE III.

MEETINGS.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-Presidents, Secretary and Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

DUES AND DELINQUENTS.

The dues to be paid by active and associate members shall be five dollars (\$5.00), due at the time of election; thereafter on January 1 of each year, in advance.

Delinquents in the payment of dues will not be entitled to the Proceedings or other publications of the Association. Delinquency for two years shall terminate membership, after due notice by the Treasurer.

No one formerly a member of the Association, who shall have allowed his membership to lapse by non-payment of dues, shall be reinstated before paying all arrears.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

DUTIES OF OFFICERS.

THE PRESIDENT.

SECTION 1. The President shall preside at all meetings, appoint all committees, unless otherwise provided for, approve all proper bills, and perform such other duties as are usually incumbent upon such an officer.

THE VICE-PRESIDENTS.

SECTION 2. The Vice-Presidents, in order of seniority, shall perform the duties of President in the absence or inability of that officer.

THE SECRETARY.

SECTION 3. The Secretary shall keep the records and archives, issue certificates of membership to honorary and cor-

responding members on election, to active and associate members when notified by the Treasurer that the proper dues have been paid.

He shall present to the Committee on Publication a synopsis of the proceedings, and such papers as the authors desire to have published by the Association. He shall receive all applications for membership and refer the same to the Executive Committee. He shall notify the Treasurer of the election of active and associate members, and shall prepare an annual report. At each annual meeting he shall appoint an Assistant Secretary.

THE TREASURER.

SECTION 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved. He shall have charge of all publications, and distribute the same to those who are entitled to them. He shall notify the Secretary when new active and associate members have paid and are entitled to certificates of membership.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties; the Association to bear the cost of this insurance.

ARTICLE VI.

DUTIES OF COMMITTEES.

THE EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall perform the duties prescribed by the Constitution and By-Laws, and such other administrative or executive duties as may be referred to it, and for which provision has not otherwise been made. The President shall be *ex-officio* chairman.

THE PUBLICATION COMMITTEE.

SECTION 2. The Publication Committee shall determine what portions of the proceedings are of sufficient general interest to be printed.

It shall also decide on the advisability of publishing the various papers presented at the annual meeting, and shall prepare for publication, contract for printing and see through the press all such papers in a volume of Annual Transactions; but all contracts for printing must first have the approval of the President and Treasurer.

THE LITERARY COMMITTEE.

SECTION 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

THE NOMINATING COMMITTEE.

SECTION 4. The Nominating Committee shall, at the annual meeting, present a list of candidates for the various offices for the ensuing year.

The vote, or votes, of the Nominating Committee shall be cast by a member, or members, who shall be designated by the members present from each State or Territory, the Army, the Navy, and the Marine Hospital Service.

Officers of the Association from Its Organization.

1891.

FIRST MEETING HELD AT **CHICAGO, ILL.**, IN THE LELAND HOTEL,
SEPT. 17-18, 1891, BRIG. GEN. NICHOLAS SENN, SURGEON
GENERAL OF WISCONSIN, PRESIDING.

1891-1892.

SECOND MEETING HELD AT **ST. LOUIS, MO.**, IN MEMORIAL HALL,
APRIL, 19, 20 AND 21, 1892.

President—Nicholas Senn, Brig. Gen. and Surg. Gen., Wis.

First Vice-President—Nelson H. Henry, Major and Surgeon, N. G. N. Y.

Second Vice-President—E. Chancellor, Lt. Col., Med. Director, N. G. Mo.

Secretary—Frederick L. Matthews, Col. and Surg. Gen., Ill. N. G.

Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.

Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.

Chairman Committee of Arrangements for 1892—Eustathius Chancellor,
Lt. Col. and Med. Dir., N. G. Mo.

1892-1893.

THIRD MEETING HELD AT **CHICAGO, ILL.**, IN RUSH MEDICAL COLLEGE
AND THE U. S. GOVERNMENT BUILDING, WORLD'S FAIR,
AUG. 8, 9 AND 10, 1893.

President—Nicholas Senn, Col. and Surg. Gen., Ill. N. G.

Honorary President—C. R. Greenleaf, Lt. Col., Dep. Surg. Gen., U. S. A.

First Vice-President—Nelson H. Henry, Major and Surgeon, N. G. N. Y.

Second Vice-President—C. M. Woodward, Lt. Col. and Surg. Gen., Mich.

Secretary—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.

Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.

Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.

Chairman Committee of Arrangements for 1893—Charles Adams, Major
and Surg., Ill. N. G.

1893-1894.

FOURTH MEETING HELD AT **WASHINGTON, D. C.**, IN THE NATIONAL THEATRE AND THE NATIONAL MUSEUM, MAY 1, 2 AND 3, 1894.

President—Nicholas Senn, Colonel and Surg. Gen. N. G. Ill.

First Vice-President—B. J. D. Irwin, Col. and Asst. Surg. Gen. U. S. A.

Second Vice-President—Louis W. Read, Col. and Surg. Gen., N. G. Pa.

Secretary—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.

Treasurer—Lawrence C. Carr, Major and Surg., Ohio N. G.

Assistant Secretary—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.

Chairman Committee of Arrangements for 1894—George Henderson, Major and Surg. Gen. D. C. N. G.

1894-1895.

FIFTH MEETING HELD AT **BUFFALO, N. Y.**, IN THE STAR THEATRE, AND ALUMNI HALL UNIVERSITY OF BUFFALO, MAY 21, 22 AND 23, 1895.

President—George M. Sternberg, Brig. Gen. and Surg. Gen., U. S. A.

First Vice-President—Louis W. Read, Col. and Surg. Gen., N. G. Pa.

Second Vice-President—Albert L. Gihon, Med. Director (Capt.), U. S. N.

Secretary—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.

Assistant Secretary—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.

Treasurer—Lawrence C. Carr, Major and Surg., Ohio N. G.

Chairman Committee of Arrangements for 1895—Albert H. Briggs, Major and Surg., N. G. N. Y.

1895-1896.

SIXTH MEETING HELD AT **PHILADELPHIA, PA.**, IN THE BROAD STREET THEATRE, HOTEL WALTON, UNIVERSITY OF PENNSYLVANIA, AND UNION LEAGUE CLUB, MAY 12, 13, and 14, 1896.

President—Louis W. Read, Col. and Surg. Gen., N. G. Pa.

First Vice-President—Albert L. Gihon, Med. Director (Com. Ret.,) U. S. N.

Second Vice-President—Charles H. Alden, Asst. Surg. Gen., U. S. A.

Secretary—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.

Treasurer—Lawrence C. Carr, Major and Surg., Ohio N. G.

Editor—Philip F. Harvey, Major and Surgeon U. S. A.

Chairman Committee of Arrangements for 1896—J. Wilks O'Neill, Major and Surg., N. G. Pa.

1896-1897.

SEVENTH MEETING HELD AT **COLUMBUS, OHIO**, IN THE HIGH STREET THEATRE, THE OHIO SENATE CHAMBER, STARLING MEDICAL COLLEGE AND COLUMBUS BARRACKS, MAY 25, 26 AND 27, 1897.

President—Albert L. Gihon, Medical Director (Commodore, Ret.), U. S. N.
First Vice-President—Edward J. Forster, Brig. Gen. and Surg. Gen. M. V. M.
Second Vice President—John Van R. Hoff, Major and Surgeon U. S. A.
Secretary—Herman Burgin, Major and Surgeon, N. G. Pa.
Treasurer—James J. Erwin, Captain and Asst. Surg., Ohio N. G.
Editor—Charles C. Foster, Major and Surgeon, M. V. M.
Assistant Secretary—James Evelyn Pilcher, Capt., Asst. Surg., U. S. A.
Chairman Committee of Arrangements for 1897—Henry M. W. Moore, Major and Surgeon, Ohio N. G.

1897-1899

EIGHTH MEETING HELD AT **KANSAS CITY, MO.**, IN CONVENTION HALL, AND COMMERCIAL CLUB, CHAMBER OF COMMERCE BUILDING, SEPT. 27, 28 AND 29, 1899.

President—Jefferson D. Griffith, Lt. Col. and Med. Dir., N. G. Mo.
First Vice-President—John Van Rensselaer Hoff, Maj. and Surg., U. S. A.
Second Vice-President—John C. Wise, Med. Insp. (Comdr.), U. S. N.
Secretary and Editor—James Evelyn Pilcher, Capt., Asst. Surg., U. S. A.
Treasurer—James J. Erwin, Capt. and Asst. Surg., Ohio N. G.
Assistant Secretary—W. A. Westervelt, Capt. and Asst. Surg., O. N. G.
Chairman Committee of Arrangements for 1899—Blencowe E. Fryer, Lt. Col. and Dep. Surg. Gen. (Ret.) U. S. A.

1899-1900.

NINTH MEETING HELD AT **NEW YORK CITY**, IN THE ACADEMY OF MEDICINE, MAY 30, 31, AND JUNE 1, 1900.

President—Charles H. Alden, Col. and Asst. Surg. Gen., U. S. A.
First Vice-President—Geo. Cook, Brig. Gen., Surg. Gen. (Ret.), N. G. N. H.
Second Vice-President—George W. Woods, Med. Director (Capt.), U. S. N.
Secretary—Charles Adams, Lt. Col. and Asst. Surg. Gen., I. N. G.
Treasurer—Herbert A. Arnold, Lt. and Asst. Surg., N. G. Pa.
Assistant Secretary—S. C. Stanton, Lt. and Asst. Surg., I. N. G.
Chairman Committee of Arrangements for 1900—Albert H. Briggs, Maj. and Surg. N. G. S. N. Y.

1900-1901.

TENTH MEETING HELD AT **ST. PAUL, MINN.**, IN THE CHAMBER OF THE
MINNESOTA HOUSE OF REPRESENTATIVES, MAY 30 AND 31,
AND JUNE 1, 1901.

President—Alexander J. Stone, Brig. Gen. and Surg. Gen., Minn.

First Vice-President—John C. Wise, Med. Director (Capt.), U. S. N.

Second Vice-President—J. Francis Calef, Brig. Gen., Surg. Gen., Conn.

Secretary—Charles Adams, Lt. Col. and Asst. Surg. Gen., I. N. G.

Treasurer—Herbert A. Arnold, Lt. and Asst. Surg. N. G. Pa.

Assistant Secretary—S. C. Stanton, Lt. and Asst. Surg., I. N. G.

Chairman Committee of Arrangements for 1901—John F. Fulton, Brig. Gen.
and Surg. Gen. Retired, of Minnesota.



Register of Members.

REVISED TO AUGUST 15, 1901.

SIGNIFICANCE OF FIGURES:—The figures preceding each name in this list, of Life, Active, Associate, Corresponding and Honorary Members, indicate the year of election to such membership. The corresponding figures in the list of Deceased Members indicate the year of decease.

SIGNIFICANCE OF DESIGNATIONS.—The designations after the names indicate (1) the grade of Military or Naval precedence, (2) the corps title, and (3) the service, National or State, in which commissioned. A star (*) before the grade indicates that the officer is not now in active service as such.

MILITARY RANK.—In the Army and National Guard, commissioned medical officers have actual rank and are officially addressed by their military grades, their corps titles being subordinate. Contract and acting assistant surgeons have relative, not actual, rank and are addressed officially by their official designation, and socially as "Doctor."

NAVAL RANK.—In the Navy, medical officers also have actual rank, but are officially addressed by their corps titles, although in social intercourse it is customary to address them simply as "Doctor"; the titles, indicating the military grades, are therefore included in parentheses in this Register.

MARINE HOSPITAL RANK.—Officers of the marine hospital service have the same corps titles as naval medical officers, and similarly are addressed officially by the corps titles and socially as "Doctor."

VOLUNTEER RANK.—The Act of Congress, "to Increase the Efficiency of the Permanent Military Establishment of the United States," providing that "all officers, who have served during the war with Spain or since as officers of the Regular or Volunteer Army of the United States, and have been honorably discharged from the service by resignation or otherwise, *shall be entitled to bear the official title and, upon occasions of ceremony, to wear the uniform of the highest grade they have held by brevet or other commission in the Regular or Volunteer service,*"—such rank has been duly inserted in this Register in connection with the names of officers entitled thereto.

CORRESPONDENCE OF MILITARY AND NAVAL GRADES.—The following table exhibits the correspondence of grades and titles in the military and naval services:

ARMY.		NAVY.	
Grades.	Titles.	Grades.	Titles.
Brig. General.	Surg. General.	Rear Admiral.	Surg. General.
		Commodore.	(Surg. Gen. and Med. Dir. Retire .
Colonel.	Asst Surg. General.	Captain.	Med. Director.
Lieut. Colonel.	Dep. Surg. General.	Commander.	Med. Inspector.
Major.	Surgeon.	Lt. Commander.	Surgeon.
Captain.	Asst. Surgeon.	Lieutenant.	Surgeon.
1st Lieut.	Asst. Surgeon.	Lt.j.[unior]g.[rade.]	Pd. Asst. Surg.
		Ensign.	Asst. Surgeon.

In addressing communications to military commissioned medical officers both the grade and title are used; in addressing military contract surgeons, and naval and marine hospital medical officers, the latter only is employed, e. g.:

Major A***B***C***, Surgeon F***G***H***, U.S.N.
 Surgeon, U. S. Army. U. S. S. I***
 Fort D***, Ariz. Naples, Italy.

LIFE MEMBERS.

ELECTED.

- 1892 Adams, Charles,
Secretary, 1899-1901.
Lt. Col. and Asst. Surg. Gen., I. N. G.,
Major and Brigade Surgeon, U. S. V.,
100 State St., Chicago, Ill.
- 1891 Alden, Charles Henry,
President, 1899-1900.
Second Vice-Prest, 1895-96
Col., Asst. Surg. Gen. (Ret.), U. S. A.,
33 Washington Park,
Newtonville, Mass.
- 1891 Chancellor, Eustathius,
Secretary, 1892-96
Second Vice-Prest. 1891-92.
Lt. Col. and Med. Dir. (Ret.), N. G. Mo.,
Oriel Bldg., Sixth and Locust Sts.,
St. Louis, Mo.
- 1891 Griffith, Jefferson Davis,
President 1897-99.
Lt. Col. and Med. Dir., N. G. Mo.,
Maj. and Chief Surg. U. S. V.,
9th and Grand Ave., Kansas City, Mo.
- 1894 Pilcher, James Evelyn,
Secretary, 1901-02.
Secretary and Editor, 1897-99
Assistant Secretary, 1896-97.
Major and Brigade Surgeon, U. S. V.,
Captain, Retired, U. S. A.,
259 W. Pomfret St.,
Carlisle, Pennsylvania.
- 1891 Senn, Nicholas,
President, 1897-99.
Col. and Surg. Gen., I. N. G.,
Lt. Col. and Chief Surg., U. S. V.,
532 Dearborn Ave., Chicago, Ill.
- 1899 Wesley, Allen A.,
Maj. and Surg. Ill. V. I.,
Capt. and Asst. Surg., I. N. G.,
3102 State St., Chicago, Ill.

ACTIVE MEMBERS.

ELECTED.

1894. Abbe, Edward Harper,
Lt. (j.g.) and Asst. Surg., N. B., M. V. M.,
405 County St., New Bedford, Mass.
- 1895 Adair, George William,
Maj. and Surg., U. S. A.,
Manila, P. I.
- 1891 Adams, Charles Francis,
Maj. and Surg., N. J. V. I.,
Capt. and Asst. Surg., N. G., N. J.,
229 Union St., Hackensack, N. J.
- 1898 Allen, Arthur West,
Maj. and Surg. N. G., Minn.,
Austin, Minn.
- 1900 Allers, Henry,
Maj. and Surg. N. G., N. J.,
Maj. and Surg. N. J. V. I.,
300 Davis Ave., Harrison, N. J.
- 1891 Almy, Leonard Ballou,
Lt. Col. and Med. Dir. (Ret.), C. N. G.,
Maj. and Chief Surg., U. S. V.,
173 Washington St., Norwich, Conn.
- 1895 Aintree, George Herbert,
Act. Asst. Surg., U. S. M. H. S.,
Port Tampa, Fla.
- 1899 Ames, Azel,
Maj. and Brig. Surg., U. S. V.,
Wakefield, Mass.
- 1894 Ames, Howard Emerson,
Surg. (Lt. Comdr.), U. S. N.,
Care Navy Dept., Washington, D. C.

ELECTED.

1894	Anderson, Frank,	Surg. (Lt. Comdr.), U. S. N., Naval Dispensary, Washington, D. C.
1901	Anderson, Winslow,	Col. and Surg. Gen. of California, 1025 Sutter St., San Francisco, Cal.
1900	Angney, William Muir,	1st Lt. and Asst. Surg., N. G. Pa., 423 S. 15th St., Philadelphia, Pa.
1893	Anthony, Frank,	Maj. and Surg. I. N. G., Maj. and Surg., Ill. V. I., First Ave., Sterling, Ill.
1893	Appel, Daniel Mitchell,	Maj. and Surg., U. S. A., Fort Bayard, New Mexico.
1896	Archibald, O. Wellington,	Col. and Surg. Gen., N. D. N. G., Jamestown, N. D.
1895	Arnold, Herbert Alonzo, <i>Treasurer 1899-1902.</i>	1st Lt. and Asst. Surg., N. G. Pa. 1st Lt. and Asst. Surg., Pa. V. C. Ardmore, Pa.
1896	Arnold, Will Ford,	Surg. (Lt.), U. S. N., Care Navy Dept., Washington, D. C.
1898	Artaud, Frank Edward,	Maj. and Surg. U. S. V., Manila, P. I.
1895	Ashenfelter, William J.,	Maj. and Surg. N. G. Pa., Maj. and Surg., Pa. V. I., Pottstown, Pa.
1897	Ashley, Maurice Cavileer,	1st Lt. and Asst. Surg., N. G. N. Y., 1st Lt. and Asst. Surg., N. Y. V. I., Middletown, N. Y.
1897	Ashmun, George C.,	Maj. and Surg. O. N. G., 94 Republic St., Cleveland, O.
1897	Austin, Charles Sterne,	Maj. and Surg. N. G. Mo., Carrollton, Mo.
1900	Austin, Hiram William,	Surg. U. S. M. H. S., 410 Chestnut St., Philadelphia, Pa.
1894	Bache, Dallas,	Col. and Asst. Surg. Gen., U. S. A., Surg. Gen. Office, Washington, D. C.
1895	Baker, John Walter,	Surg. (Lt. Ret.), U. S. N., Aurora, Ind.
1892	Baker, Washington Hopkins,	Maj. and Surg. (Ret.), N. G. Pa., 1610 Sumner St., Philadelphia, Pa.
1894	Balch, Lewis,	Maj. and Brigade Surg., U. S. V., Maj. and Surg., N. G. N. Y., 14 Washington Ave., Albany, N. Y.
1896	Banister, John Monroe,	Maj. and Surg., U. S. A., West Point, N. Y.
1895	Barber, George Holcomb,	Surg. (Lt.), U. S. N., Care Navy Dept., Washington, D. C.
1892	Barker, Christopher F.,	Maj. and Surg., R. I. M., 32 Bull St., Newport, R. I.
1892	Barnes, Algernon S.,	Brig. Gen., Surg. Gen. (Ret.), N. G. Mo., 5434 Maple Ave., St. Louis, Mo.

ELECTED. *

- 1898 Barney, Reuben, Jr., Capt. and Asst. Surg., N.G.Mo.,
Chillicothe, Mo.
- 1900 Barns, Cass Grove, Col. and Surg. Gen., N.G., Neb.,
Albion, Neb.
- 1897 Barry, William Francis, 1st Lt. and Asst. Surg., R.I.M.,
Woonsocket, R. I.
- 1899 Barstow, James Mason, Lt. Col. and Dep. Surg. Gen. N.G.Ia.,
Council Bluffs, Ia.
- 1894 Battle, Samuel Westray, Maj. and Asst. Surg. Gen., N.C.,
P. A. Surg. (Lt. j. g., Ret.), U.S.N.,
Asheville, N. C.
- 1894 Bayles, George, Ex-Maj., Surg. N.Y.V.H.A.(Civil War),
408 Main St., Orange, N. J.
- 1896 Belcher, William Nathan, Capt. and Asst. Surg. N.G.N.Y.,
25 Portland Ave., Brooklyn, N. Y.
- 1895 Bell, Robert Eddy, 2d Lt. Amb. Corps, M.V.M.,
Lowell, Mass.
- 1893 Benedict, John Mitchell, Ex-Maj. and Surg., Conn. N.G.,
81 N. Main St., Waterbury, Conn.
- 1901 Bentley, Edwin, Maj. and Surg. (Ret.), U.S.A.,
Little Rock, Ark.
- 1898 Benton, Frederick Leslie, Asst. Surg. (Lt. j. g.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1900 Berkley, George Carlton, Maj. and Surg., N.G.Vt.,
130 Main St., St. Albans, Vt.
- 1893 Bertolotte, Daniel Nicholas, Medical Inspector (Comdr.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1895 Beyer, Henry Gustav, Surg. (Lt. Comdr.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1895 Birmingham, Henry P., Maj and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.
- 1894 Blackwood, Norman Jerome, P. A. Surg., (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1900 Blakeman, Robert Sylvester, P. A. Surg. (Lt. j. g.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1901 Block, William H., Capt. and Asst. Surg., U.S.A.,
Medical Supply Depot, Havana, Cuba.
- 1895 Blood, Robert Allen, Brig. Gen. and Surg. Gen., M.V.M.,
39 High St., Charlestown, Mass.
- 1901 Bloodgood, Delavan, Med. Dir. (Capt. Ret.), U.S.N.,
320 Clermont Ave., Brooklyn, N. Y.
- 1897 Blubaugh, Charles B., Lt. Col. and Med. Dir., W. Va. N.G.
1010 Murdock Ave., Parkersburg, W. Va.
- 1900 Bogart, Arthur Henry, Maj. and Surg. N.Y.V.I.
Capt. and Asst. Surg., N.G.N.Y.,
139 Seventh Ave., Brooklyn, N. Y.
- 1895 Borden, William Cline, Maj. and Surg. U.S.A.,
Maj. and Brig. Surg., U.S.V.
Washington Barracks, D. C.
- 1894 Boyd, John C., Medical Inspector (Comdr.) U.S.N.
Care Navy Dept., Washington, D. C.

ELECTED.

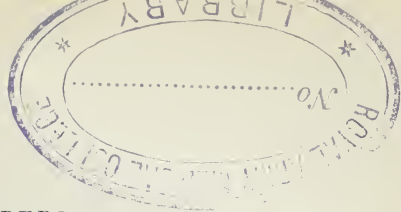
- 1895 Boyd, Robert, Capt. and Asst. Surg., U.S.V.,
Manila, P. I.
- 1891 Bradbury, Bial Francisco, Maj. and Brig. Surg., U.S.V.,
Maj. and Surg., Me.V.M.,
Norway, Me.
- 1896 Bradley, Alfred E., Maj. and Brig. Surg., U.S.V.,
Capt. and Asst. Surg., U.S.A.,
Fort Snelling, Minn.
- 1895 Bradley, George Perley, Medical Director, (Captain,) U.S.N.,
Washington, D. C.
- 1891 Brannen, Dennis J., Capt. and Asst. Surg., N. G., Ariz.,
Flagstaff, Ariz.
- 1892 Briggs, Albert Henry, Maj. and Surg., N.G.N.Y.,
Maj. and Surg., N.Y.V.I.,
267 Hudson St., Buffalo, N. Y.
- 1898 Brodrick, Richard Godfrey, P. A. Surg. (Lt. j. g. Ret.), U.S.N.,
1037 Fifth Ave., New York, N. Y.
- 1900 Brokaw, William F., Lt. and Surg., N.B., O.N.G.,
1040 Wilson Ave., Cleveland, Ohio.
- 1897 Brooke, John, Maj. and Surg. (Ret.), U.S.A.,
Radnor, Pa.
- 1900 Brooks, Harlow, Capt. and Asst. Surg., N.G.N.Y.,
7th Regt. Armory, New York, N. Y.
- 1894 Brown, Orland J., Maj. and Surg., M.V.M.,
North Adams, Mass.
- 1900 Brownell, Carl DeWolf, P. A. Surg., (Lt.) U.S.N.,
Care Navy Dept., Washington, D. C.
- 1895 Brubaker, John L., 1st Lt. and Asst. Surg., N.G., Pa.,
1224 4th Ave., Altoona, Pa.
- 1898 Bruce, Charles E., Maj. and Surg. (Ret.), N.G.N.Y.,
176th St. and Amsterdam Ave.,
New York, N. Y.
- 1898 Brugman, Albert Ferdinand, Capt. and Asst. Surg., N.Y.V.I.,
1st Lt. and Asst. Surg., N.G.N.Y.,
Hotel Endicott, New York, N. Y.
- 1895 Brush, Edmund Cone, Brig. Gen. and Surg. Gen., O.N.G.,
Zanesville, O.
- 1891 Bryant, Joseph Decatur, Brig. Gen., Surg. Gen. (Ret.) N.G.N.Y.,
54 W. 30th St., New York, N. Y.
- 1893 Budlong, John Clark, Brig. Gen., Surg. Gen. (Ret.), R.I.M.,
604 Westminster St., Providence, R. I.
- 1895 Bunts, Frank Emory, Maj. and Surg. O.V.C.,
Capt. and Asst. Surg., O.N.G.,
275 Prospect St., Cleveland, O.
- 1900 Burbank, Thomas Sparrow, Lt. and Surg., N.R., N.G.N.C.,
Wilmington, N. C.
- 1896 Burgin, Herman, Maj. and Surg., N.G. Pa.,
Secretary, 1896-97. Maj. and Surg. Pa.V.I.,
Germantown, Pa.
- 1895 Byrne, Charles C., Col. and Asst. Surg. Gen. (Ret.), U.S.A.,
Care Surg. Gen., Washington, D. C.

ELECTED.

- 1899 Calef, J. Francis,
Second Vice-Pres., 1900-1901. Brig. Gen. and Surg. Gen., C.N.G.,
Middletown, Conn.
- 1897 Campbell, William Francis, 1st Lt. and Asst. Surg., N.G.N.Y.,
127 Lafayette Ave., Brooklyn, N. Y.
- 1897 Carpenter, Dudley Newcomb, P. A. Surg. (Lt. j. g.) U.S.N.,
Care Navy Dept., Washington, D. C.
- 1899 Carr, E. Arthur, Maj. and Surg., Neb. N.G.,
1205 O St., Lincoln, Neb.
- 1893 Carr, George Wheaton, Lt. Col. and Med. Dir. (Ret.), R.I.M.,
27 Waterman St., Providence, R. I.
- 1894 Carrington, Charles Venable, Capt. and Asst. Surg., Va. Vols.,
932 Park Ave., Richmond, Va.
- 1897 Carter, Edward Champe, Maj. and Surg., U.S.A.,
Maj. and Brigade Surg. U.S.V.,
1814 G St. N. W., Washington, D. C.
- 1893 Cassidy, Patrick, Ex-Brig. Gen., and Surg. Gen., C.N.G.,
Norwich, Conn.
- 1895 Castle, Charles Henry Capt. and Asst. Surg., O.N.G.,
Capt. and Asst. Surg., O.V.I.,
215 W. 9th St., Cincinnati, O.
- 1895 Cawley, Morris Franklin 1st Lt. and Asst. Surg., N.G.Pa.,
31 N. 9th St., Allentown, Pa.
- 1891 Chandler, Ralph, Capt. and Asst. Surg. Wis.N.G.,
Cor. Sec., 1891-93, 13 Grand Ave., Milwaukee, Wis.
- 1892 Clark, Thomas Chalmers, Maj. and Surg., N.G., Minn.,
Maj. and Surg., Minn.V.I.,
Stillwater, Minn.
- 1897 Clark, Joseph Taylor, Maj. and Surg., U.S.V.,
Capt. and Asst. Surg., U.S.A.,
Care War Dept., Washington, D. C.
- 1901 Coffin, John William, Capt. and Asst. Surg., N.G.P.,
Beaver Falls, Pa.
- 1898 Cogswell, William, Maj. and Surg., M.V.M.,
Maj. and Surg., Mass.V.I.,
241 Boylston St., Boston, Mass.
- 1900 Colby, Charles DeWitt, Maj. and Surg., Mich.V.I.,
Capt. and Asst. Surg., Mich.S.T.,
Albion, Mich.
- 1893 Cole, Charles M., 1st Lt. and Asst. Surg., R.I.M.,
250 Broadway, Newport R. I.
- 1895 Cook, Charles P., Col. and Asst. Surg. Gen., N.G.N.Y.,
243 Warren St., Hudson, N. Y.
- 1898 Cook, Frank Clarendon, P. A. Surg., (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1893 Cook, George, Brig. Gen., Surg. Gen. (Ret.), N.G.N.H.,
First Vice-President, 1899-1900 Maj. and Chief Surg., U.S.V.,
16 Centre St., Concord, N. H.
- 1899 Coon, George M., 1st Lt. and Asst. Surg. Minn.N.G.,
110 Lowry Arcade, St. Paul, Minn.
- 1894 Corwin, Richard Warren, Col. and Asst. Surg. Gen., N. G., Colo.,
Pueblo, Colo.

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1895	Cowell, George B.,	1st Lt. and Asst. Surg., Conn. N.G. 120 E. Washington Ave., Bridgeport, Conn.
1895	Crandall, Rand Percy,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1894	Crispel, Charles Winegar,	1st Lt. and Asst. Surg., N.G.S.N.Y., Rondout, N. Y.
1901	Cronyn, William J.,	Capt. and Asst. Surg. W.N.G., 245 14th St., Milwaukee, Wis.
1897	Crooker, George Hazard,	Ex-Capt. and Asst. Surg., R.I.M., 159½ Benefit St., Providence, R. I.
1894	Currier, Edward Hervey,	Lt. Col. and Med. Dir., N.H.N.G., 728 Elm St., Manchester, N. H.
1898	Czibulka, Alfons Clemens,	1st Lt. and Asst. Surg., I.N.G., Warren, Ill.
1901	Davis, John S.	1st Lt. and Asst. Surg. I.N.G., 9139 Commercial Ave., Chicago, Ill.
1895	Dawson, Lewis Reeves,	Lt. Col. and Brig. Surg., N.G., Wash., Maj. and Surg., Wash. V.I., Box 249, Seattle, Wash.
1895	Day, Frank Leslie,	Maj. and Surg., R.I.M., 240 Benefit St., Providence, R. I.
1894	Dearing, Howard Sumner,	Maj. and Surg., M.V.M., Maj. and Surg., Mass. V.H.A., 607 Tremont St., Boston, Mass.
1898	de Forest, Henry Pelouze,	Maj. and Surg., N.G.N.Y., Ex-Acting Assistant Surg., U. S. A., 369 Hancock St., Brooklyn, N. Y.
1891	de Niedman, Wladimir Feodor,	Maj. and Surg., U.S.V., Manila, P. I.
1895	Derr, Ezra Z.,	Medical Inspector, (Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1894	Devine, William H.,	Lt. Col. and Med. Dir., M.V.M., Maj. and Chief Surg., U.S.V., 595 Broadway, South Boston, Mass.
1897	Dickerson, John Henry,	Capt. and Asst. Surg., O.N.G., Capt. and Asst. Surg., O.V.I., 225 N. Champion Ave., Columbus, O.
1897	Dickson, Samuel Henry,	Surg. (Lt. Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1899	Dillenbeck, Fred E.,	Capt. and Asst. Surg. N.G.Kan., El Dorado, Kan.
1895	Dixon, Charles Henry,	Maj. and Surg., N.G.Mo., 3345 Morgan St., St. Louis, Mo.
1901	Dorsey, John H.	1st Lt. and Asst. Surg., Minn.N.G., Glencoe, Minn.
1898	Dougherty, Arthur C.	2d Lt. and Asst. Surg., N.G.N.J., 158 Washington St., Newark, N. J.
1901	Drake, Clarence Eugene,	Maj. and Surg., O.N.G., 324 Putnam Ave., Zanesville, Ohio.
1900	Drumheller, Francis E.,	1st Lt. and Asst. Surg., N.G.Pa., Sunbury, Pa.



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1893	Dutton, Charles Elvan,	Capt. and Asst. Surg., Minn.V.I., 1st Lt. and Asst. Surg., N.G.Minn., 602 Nicollet Ave., Minneapolis, Minn.
1893	Eagleson, James Beaty,	Col. and Surg. Gen., N.G.Wash., 512 Burke Bldg., Seattle, Wash.
1894	Edie, Guy L.,	Maj. and Surg., U.S.A., Maj. and Brigade Surg., U.S.V., Care War Dept., Washington, D. C.
1891	Edwards, John B.,	Brig. Gen. and Surg. Gen., Wis. N.G., Mauston, Wis.
1900	Elliott, Gilbert M.,	1st Lt. and Asst. Surg., Me.V.M., Brunswick, Me.
1895	Emmerling, Karl A.,	1st Lt. and Asst. Surg., N.G. Pa., 1st Lt. and Asst. Surg., Pa V.I., 48 S Rebecca St., Pittsburg, Pa.
1895	Erwin, James Jav., <i>Treasurer, 1896-99.</i>	Capt. and Asst. Surg., U S.V., Capt and Asst Surg., O.N.G., 1617 Cedar Ave., Cleveland, O.
1901	Evans, Carroll D.	Col. and Surg. Gen., Nebraska, Columbus, Neb.
1891	Evans, Theodore W.,	Maj. and Surg., Wis. N.G., Maj. and Surg., Wis. V.I., 3 Pinckney St., Madison, Wis.
1901	Fairchild, David S.,	Maj. and Surg., N. G. Ia., Clinton, Iowa.
1897	Fales, Warren Dexter,	1st Lt. Cmdg. Amb. Corps, N.G.D.C. 915 L St., N. W., Washington, D. C.
1898	Farenholt, Ammen,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1896	Farrell, Patricinne J. H.,	Capt. and Asst. Surg., N.G.Cal., 135 Geary St., San Francisco, Cal.
1891	Festorazzi, Angelo,	Ex-1st Lt. and Asst. Surg., S.T.Ala., 153 Government St., Mobile Ala.
1897	Fish, Earl Hamilton,	1st Lt. and Asst. Surg., N.G.Colo., 2535 Champa St., Denver, Colo.
1892	Fitz Gerald, Reynaldo Juan,	Lt. Col. and Med. Dir., N.G.Minn., Maj. and Surg., Minn.V.I., 128 S. Fifth St., Minneapolis, Minn.
1897	Flagg, Charles Edward Belin,	Capt. and Asst. Surg., U.S.A., Care Surg. Gen., Washington, D. C.
1901	Ford, Francis C.,	Lt. Col. and Med. Dir., Tex. V. G., Maj. and Brig. Surg., U. S. V., Nacogdoches, Tex.
1893	Forwood, William Henry,	Col. and Asst. Surg. Gen., U.S.A., Washington, D. C.
1894	Foster, Charles, Chauncey, <i>Editor 1896-97.</i>	Maj. and Surg., M.V.M., Maj. and Surg., Mass.V.I. 8 Elmwood Ave., Cambridge Mass.
1892	Foster, Romulus Adams,	1st Lt. and Asst. Surg., N.G.D.C 2029 Q St. N. W., Washington, D. C.

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1893, Fowler, George Ryerson,	Lt. Col. and Brig. Surg., N.G.N.Y., Maj. and Chief Surg., U.S.V., 301 DeKalb Ave., Brooklyn, N. Y.
1893 French, Charles Henry,	Lt. Col. and Med. Dir., R.I.M., 109 Broadway, Pawtucket, R. I.
1897 Frick, Euclid Bernardo,	Capt. and Asst. Surg., U. S. A., San Juan, P. R.
1897 Fryer, Blencowe E.,	Lt. Col., Dep. Surg. Gen. (Ret.) U.S.A., 520 E. 9th St., Kansas City, Mo.
1891 Fuller, Charles Gordon,	Maj and Surg., I.N.G., 100 State St., Chicago, Ill.
1895 Gandy, Charles Moore,	Maj. and Surg., U.S.A., Maj. and Chief Surg., U.S.V., Manila, P. I.
1894 Gardner, Edwin Fisher,	Maj. and Surg., U.S.A., Manila, P. I.
1895 Gates, Manley Fitch,	P. A. Surg. (Lt. j. g.), U.S.N., Naval Hospital, Norfolk, Va.
1900 Geer, Edward,	Lt. and Surg. N.R.N.G.Md., 1614 Bolton St., Baltimore, Md.
1900 Gettier, Harry Ernshaw,	Ex-Act. Asst. Surg., U. S. A., Littlestown, Pa.
1897 Gibson, Robert Jackson,	Maj, and Surg., U.S.A., San Francisco, Cal.
1893 Girard, Alfred C.,	Lt. Col., and Dep. Surg., Gen., U.S.A., Lt. Col. and Chief Surg., U.S.V., San Francisco, Cal.
1894 Glennan, James D.,	Maj. and Brig. Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Care Surg. Gen., Washington, D. C.
1896 Glover, Lawrence Ritchfield,	Ensign and Asst. Surg., N. R., N.G.N.J. Haddonfield, N. J.
1892 Godfrey, Charles Cartlidge,	Ex-Maj. and Surg., C. N. G., 242 State St., Bridgeport, Conn.
1892 Godfrey, E. L. B.,	Col. and Asst. Surg. Gen , N.G.N.J 400 Linden St , Camden, N. J.
1894 Godfrey, Guy Charles Moore,	Capt. and Asst. Surg., U.S.A., Manila, P. I.
1899 Goodrich, Asa F.,	1st Lt. and Asst. Surg., N.G. Minn., Germania Bldg., St. Paul, Minn.
1897 Gotwald, David King,	Capt. and Asst. Surg., O N.G., Capt. and Asst. Surg., O.V.I., Springfield, O.
1891 Grannis, Edward H ,	Maj, and Surg., Wis. N. G., 1st Lt and Asst. Surg., Wis. V. I., Menominee, Wis.
1894 Grant, Thomas Page,	Capt. and Asst. Surg (Ret.) K.S.G., 815 Third Ave., Louisville, Ky.
1899 Grant, William West,	Col. and Surg. Gen., of Colorado, Denver, Colo.

ELECTED.

- 1894 Green, Charles Montraville, Maj. and Surg., M V.M.,
78 Marlborough St., Boston, Mass.
- 1896 Greene, Francis V., P. A. Surg. (Lt. Ret.), U.S.N.,
33 S. 19th St., Philadelphia, Pa.
- 1899 Grothan, Ole, Maj. and Surg., Neb.V.I.,
St. Paul, Neb.
- 1898 Grunwell, Alfred Gilbert, P. A. Surg. (Lt. j.g.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1897 Guerin, Lovett T., Maj. and Surg., O.N.G.,
578 N. High St., Columbus, O.
- 1897 Gunsaulus, Fred., Capt. and Asst. Surg., O.N.G.,
29 W. Long St., Columbus, O.
- 1897 Guest, Middleton Semmes, P. A. Surg. (Lt), U.S.N.,
Care Navy Dept , Washington, D. C.
- 1896 Guthrie, Joseph Alfred, P. A. Surg (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1892 Hake, William F., Maj. and Surg., M.S.T.,
47 E Bridge St , Grand Rapids, Mich.
- 1892 Halberstadt, George Howell, Maj. and Surg., N.G.Pa.,
218 Market St., Pottsville, Pa.
- 1891 Halley, George, Maj. and Surg , N.G.Mo ,
438 New Ridge Bldg., Kansas City, Mo.
- 1900 Hamilton, John, 1st Lt. and Asst Surg. (Ret.), N.G.I.,
1st Lt. and Asst Surg., Iowa V I.,
Cedar Rapids, Iowa.
- 1898 Hammond, Josiah Shaw, Maj. and Surg , N.G.Mont ,
Butte, Mont.
- 1896 Hanson, George F., Lt. Col. and Med. Dir , N.G.Cal.,
3534 Mission St., San Francisco, Cal.
- 1901 Harmer, Joseph Randolph, Contract Surgeon, U.S.A.,
Fort Fremont, via Beaufort, S. C.
- 1899 Harrelson, Nathan O , Maj. and Surg. U.S.V.,
517 Rialto Bldg., Kansas City, Mo.
- 1895 Harris, Henry Sutton Tarring, Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.
- 1901 Harris, Herbert I., Contract Surg., U.S.A.,
Fort Snelling, Minn.
- 1894 Harvey, Norman Darrell, Maj. and Surg., R. I. M.,
1st Lt. and Asst. Surg., R. I. V. I.,
260 Benefit St., Providence, R. I.
- 1894 Harvey, Philip Francis, Lt. Col. and Dep. Surg. Gen., U.S.A.,
Editor 1895-96. Lt. Col. and Chief Surg., U.S.V.,
Manila, P. I.
- 1893 Havard, Valery, Lt. Col. and Chief Surg., U.S.V.,
Maj. and Surg., U.S.A.,
Havana, Cuba.
- 1898 Hayes, Robert Goodloe Harper, 1st. Lt. and Asst. Surg., U.S.V.,
11 Spring St., Bellefonte, Pa.
- 1896 Heizmann, Charles Lawrence, Lt. Col. and Dep. Surg. Gen., U.S.A.,
Manila, P. I.

ELECTED.

1892	Hendley, Frank W.,	Maj. and Surg., O.N.G., Maj. and Surg., O.V.I., 785 E. McMillan St., Cincinnati, O.
1901	Hendry, William,	Capt. and Asst. Surg., O.N.G., 1327 Cedar Av., Cleveland, Ohio.
1891	Henry, Nelson H., <i>First Vice-President, 1891-93.</i>	Col. and Asst. Surg. Gen., N.G.N.Y., Maj. and Chief Surg., U.S.V., 14 E. 10th St., New York, N. Y.
1896	Hersey, Freeman Clark,	Lt. Col. and Med. Dir., M. V. M., 96 Huntington Ave., Boston, Mass.
1897	Hobbs, Wilbert A.,	Maj. and Surg., O.V.I., Capt. and Asst. Surg., O.N.G., East Liverpool, O.
1891	Hoff, John Van Rensselaer, <i>President, 1901-1902.</i> <i>First Vice-President, 1897-99.</i> <i>Second Vice-President, 1896-97.</i>	Lt. Col. and Chief Surg., U.S.V., Maj. and Surg., U.S.A., Surgeon General's Office, Washington, D. C.
1896	Hoffman, John Raymond,	Capt. and Asst. Surg., I.N.G., 63 Wabash Ave., Chicago, Ill.
1893	Hooper, Henry,	Ex-Capt. and Asst. Surg., I.N.G., 541 N. State St., Chicago, Ill.
1896	Hopkins, William Evelyn,	Ex-Col. and Surg. Gen., N.G. Cal., 803 Sutter St., San Francisco, Cal.
1892	Hough, Charles Pinckney,	Ex-Brig. Gen. and Surg. Gen., N.G. Mont., 415 Atlas Blk., Salt Lake City, Utah.
1895	Howard Deane Childs,	Capt. and Asst. Surg., U.S.A., Havana, Cuba.
1897	Huddleston, John Henry,	Capt. and Asst. Surg., N.G.N.Y., 126 W. 85th St., New York, N. Y.
1899	Huidekoper, Rush Shippen,	Lt. Col. and Chief Surg., U.S.V., Army and Navy Club, 16 W. 31st St., New York, N. Y.
1899	Hunter, Randall R.,	Major and Brig. Surg., U.S.V., Fulton, Kans.
1899	Hutchings, Robert Koehler,	1st Lt. and Asst. Surg., N. G. Co'o., Colorado Springs, Colo.
1896	Hyde, James Nevins,	Lt. N. R. Ill., Ex-P. A. Surg., U.S.N., 100 State St., Chicago, Ill.
1900	Iglehart, James Davidson,	Capt. and Asst. Surg., N. G. Md., 211 W. Lanvale St., Baltimore, Md.
1894	Ives, Francis Joseph,	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Fort Sheridan, Ill.
1894	* Izlar, Roberts Poinsett,	Maj. and Surg., Fla. V.I., 1st Lt. and Surg., S.T. Fla. Waycross, Ga.
1899	Jackson, Charles Warren	1st Lt. and Asst. Surg., N.G.N.Y., 130 W. 81st St., New York, N. Y.
1894	Jackson, Jabez North,	Maj. and Brig. Surg., U.S.V., Capt. and Asst. Surg., N. G., Mo., 413 Rialto Bldg., Kansas City, Mo.

ELECTED.

1901	Jacoby, William,	Maj. and Surg., Minn.N.G., Wells, Minn.
1892	Jarrett, Arthur R.,	Capt. and Asst. Surg., N.G.N.Y. Capt. and Asst. Surg., N.Y.V.I., 95 Halsey St., Brooklyn, N. Y.
1895	Jarvis, Nathan Sturges,	Lt. Col., Asst. Surg. Gen., N.G.N.Y., Maj. and Brig. Surg., U.S.V., Capt. (Ret.) U.S.A., 142 Madison Ave., New York, N. Y.
1897	Jenne, James N.,	Brig. Gen. and Surg. Gen., Vermont, Maj and Chief Surg., U.S.V., 130 Main St., St. Albans, Vt.
1894	Johnston, James,	Maj. and Surg., N.G.Pa., Maj. and Surg., Pa.V.I., Bradford, Pa.
1895	Johnston, William McCandless,	Maj. and Surg., N.G.Pa., Maj. and Surg., Pa.V.I., Sewickley, Pa.
1899	Jones, George H.,	1st Lt. and Asst. Surg., Ohio V.I., 2304 Franklin Ave., Toledo, O.
1897	Jordan, Charles Simonton,	Capt. and Asst. Surg., S.G.N.C., Capt. and Asst. Surg., N.C.V.I., Asheville, N. C.
1892	Kaufman, Franklin John,	1st Lt. and Asst. Surg., N.G.,N.Y., 311 W. Genesee St., Syracuse, N. Y.
1896	Kean, Jefferson Randolph,	Lt. Col. and Chief Surg., U.S.V., Maj. and Surg., U.S.A., Havana, Cuba.
1899	Keller, James McDonald,	Col. and Surg. Gen., Ark.N.G., Hot Springs, Ark.
1897	Kemble, Lewis Hasbrouck,	Maj. and Surg., N. G., Colo., Maj. and Surg., Colo. V.I., Aspen, Colo.
1898	Kemp, Franklin M.,	1st Lt. and Asst. Surg., U. S. A., Manila, P. I.
1898	Kendall, Francis Drake,	Maj. and Surg., S.C.V.T., 1309 Plain St., Columbia, S. C.
1897	Kendall, William Pratt,	Maj. and Surg., U.S.A., Major and Brig. Surgeon., U.S.V., Manila, P. I.
1897	Kennedy, Robert Morris,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1895	Kenyon, George Henry,	Brig. Gen. and Surg. Gen., R.I.M., 123 N. Main St., Providence, R. I.
1895	Kilbourne, Henry Sales,	Maj. and Surg., U.S.A., Presidio, San Francisco, Cal.
1895	Kimball, James P.	Lt. Col. and Dept. Surg. Gen., U.S.A., Omaha, Neb.
1901	King, Charles F.,	Capt. and Asst. Surg., Wis. N.G., Hudson, Wisconsin.

ELECTED.

1893	Kingston, Robert J.,	1st Lt. and Asst. Surg., N.G.N.Y., 185 Grand St., Newburgh, N. Y.
1895	Kneedler, William L.,	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., West Point, N. Y.
1896	Kulp, John Stewart,	Maj. and Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Army Building, New York, N. Y.
1896	Kuyk, Dirk Adrian,	Maj. and Surg., Va. V., 4 W. Grace St., Richmond, Va.
1891	La Garde, Louis A.,	Maj. and Surg. U.S.A., Soldier's Home, Washington, D. C.
1893	La Pierre, Julian,	Maj. and Surg., Conn.N.G., Maj. and Surg., Conn.V., 220 Central Ave., Norwich, Conn.
1896	Leach, Philip,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1898	Ledeboer, Francois S.,	1st Lt. and Asst. Surg., N.G.S.D., Spearfish, S. Dak.
1895	Lee, Edward Wallace,	Col. and Surg. Gen., Nebraska, St. Louis, Mo.
1900	Lee, George Bolling,	Ex-Act. Asst. Surg. U.S.A., 215 W. 43d St., New York, N. Y.
1893	Lee, Simeon Lemuel,	Col. and Surg. Gen., Nevada, Carson, Nev.
1900	Le Seure, Oscar,	Maj. and Brig. Surg., U.S.V., 32 Adams Av., Detroit, Mich.
1901	Lippincott, Albert Church	Col. and Surg. Gen. of Idaho, 144 W. 103d St., New York, N. Y.
1894	Lippincott, Henry,	Col. and Asst. Surg. Gen., U.S.A., Governor's Island, New York, N. Y.
1898	Lippitt, William Fontaine,	Maj. and Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Mani'a P. I.
1891	Little, Frederick H.,	Brig. Gen., and Surg. Gen. (Ret.), Iowa, 116 W. 2d St., Muscatine, Ia.
1897	Lowes, Joseph E.,	Ex-Brig. Gen. and Surg. Gen., Ohio, Dayton, Ohio.
1896	Lowndes, Chas. Henry Tilghman,	P. A. urg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1901	Lyster, Theodore Charles,	1st. Lt. and Asst. Surg. U.S.A., Fort Schuyler, N. Y.
1900	Mac Evitt. John Cowell,	Lt. and Surg., N.M., N.G.N.Y., 407 Clinton St., Brooklyn, N. Y.
1895	McCandless, Alexander A. E.,	Ex-Lt. Col., Surg. in Chief, N.G.P., Pittsburg, Pa
1895	McCarthy, William Daniel,	Lt. Col. and Div. Surg., N.G.Cal., Maj. and Surg. Cal. V.I., 111 Eddy St., San Francisco, Cal.

ELECTED.

1894	McCaw, William J.,	Maj. and Surg., R. I. M., 222 Benefit St., Providence, R. I.
1900	McClintic, Thomas Brown,	Asst. Surg., U.S.M.H.S., Southport, N. C.
1899	McComb, J. Baldwin,	Capt. and Asst. Surg., O.N.G., 217 E. State St., Columbus, O.
1898	McCord, Thomas Chester,	Maj. and Surg., I.N.G., Maj. and Surg., Ill.V.I., Paris, Ill.
1901	McCormick, Louis P.,	Capt. and Asst. Surg., N.G. a., Connellsville, Pa.
1894	McDill, John R.,	Maj. and Surg., U.S.V., Manila, P. I.
1900	Mahoney, George William,	Capt. and Asst. Surg., I.N.G., Capt. and Asst. Surg., Ill.V.I., 100 State St., Chicago, Ill.
1891	Mann, Alban L.,	Maj. and Surg. (Ret.), I.N.G., 214 Chicago St., Elgin, Ill.,
1891	Marion, Otis H.,	Lt. Col., and Med. Dir., M.V.M., Maj. and Surg., Mass. V.I., 22 Harvard Ave., Allston Station, Boston, Mass.
1894	Marmion, Robert Augustine,	Medical Director (Capt.), U.S.N., Navy Dept., Washington, D. C.
1895	Marsh, William H.,	Act. Asst. Surg., U.S.M.H.S., Solomons, Md.
1893	Martin, Edward,	Maj. and Surg., N.G.Pa., Maj. and Brig. Surg., U.S.V., 415 S. 15th St., Philadelphia, Pa.
1896	Martin, Frank H.,	1st Lt. and Asst. Surg., Kans. V. I., Topeka, Kans.
1894	Mason, Charles Field,	Maj. and Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Fort Sam Houston, San Antonio, Texas.
1895	Maus, Louis Mervin,	Lt. Col. and Chief Surg., U.S.V., Maj. and Surg., U.S.A., Manila, P. I.
1893	Maybury, William Jordan,	Col. and Surg. Gen. (Ret.) of Maine, Saco, Me.
1897	Mayer, Daniel,	Brig. Gen. and Surg. Gen., W. Va., Charleston, W. Va.
1901	Meacham, Franklin Adams,	Maj. and Surg., U.S.V., Manila, P. I.
1895	Mead, Harry,	Capt. and Asst. Surg., N.G.N.Y., 1st Lt. and Asst. Surg., N.Y.V.I., 758 Elmwood Ave., Buffalo, N. Y.
1895	Meyer, Robert C. J.,	Ensign and Asst. Surg. Ill. N.R., Moline, Ill.

ELECTED.

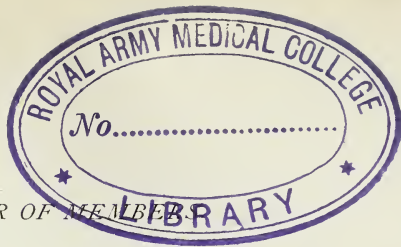
- 1895 Middleton, Johnson Van Dyke, Lt. Col., Dep. Surg. Gen. (Ret.), U.S.A.,
Occidental Hotel, San Francisco, Cal.
- 1900 Milligan, Samuel Cargill, Maj. and Surg., N.G.Pa.,
1st Lt. and Asst. Surg., Pa.V.I.,
609 Smith Block, Pittsburg, Pa.
- 1900 Miner, Charles H., 1st Lt. and Asst. Surg., N.G.Pa.,
1st Lt. and Asst. Surg., Pa.V.I.,
Wilkesbarre, Pa.
- 1900 Montelius, Ralph W., Maj. and Surg., N.G.Pa.,
1st Lt. and Asst. Surg., a.V.I.,
Mt. Carmel, Pa.
- 1895 Moore, Henry McIntyre Worthington-Lt. Col. and Chief Surg., O.N.G.,
Maj. and Surg. Ohio V.L.A.,
656 E. Long St., Columbus, Ohio.
- 1900 Moore, John Miller, P. A. Surg., (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1895 Morris, Lewis, P. A. Surg., (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1898 Morris, Lewis Coleman, Capt. and Asst. Surg., Ala.N.G.,
Chalifaux Bldg., Birmingham, Ala.
- 1898 Morse, William E. H., Capt. and Asst. Surg., N.G.Ia.,
Algona, Kossuth Co., Ia.
- 1900 Munson, Edward Lyman, Capt. and Asst. Surg., U.S.A.,
Surg. Generals Office, Washington, D. C.
- 1900 Murray, Frank W., Maj. and Surg. (Ret.), N.G.N.Y.,
37 W. 39th St., New York, N. Y.
- 1894 Murray, Robert Drake, Surg. U.S.M.H.S.,
Key West, Fla.
- 1891 Myers, Charles F. W., Lt. Col. and Med. Dir., N.G.N.J.,
108 Broadway, Paterson, N. J.
- 1894 Newgarden, George J., Capt. and Asst. Surg., U.S.A.,
Fort Mason, Cal.
- 1896 Norton, Oliver Dwight, Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1892 O'Neill, James Wilks, Maj. and Surg., (Ret.), N.G.Pa.,
2110 Spruce St., Philadelphia, Pa.
- 1897 Osborn, Arthur Leland, Maj. and Surg., O.N.G.,
Maj. and Surg., Ohio V. I.,
Norwalk, Ohio.
- 1892 Owen, William Otway, Maj. and Surg. U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.
- 1895 Parkhill, Clayton, Col. and Surg. Gen. (Ret.), N.G. Colo.,
Maj. and Chief Surg., U.S.V.,
McPhee Bldg., Denver, Colo.
- 1896 Peck, George, Med. Dir. (Capt. Ret.), U.S.N.,
926 N. Broad St., Elizabeth, N. J.
- 1900 Peck, Oscar Waite, Brig. Gen., and Surg., Gen., Vermont,
Winooski, Vt.
- 1897 Peckham, Charles F., Lt. and Surg., N.B., R.I.M.,
176 Benefit St., Providence, R. I.

ELECTED.

- 1892 Peckham, Cyrus T., Surgeon, U.S.M.H.S., Galveston, Tex.
- 1897 Penrose, George H., Capt. and Q.M., U.S.A., War Dept., Washington, D. C.
- 1895 Percy, Henry Tucker, Surg. (Lt. Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
- 1894 Perley, Henry Otis, Maj. and Surg., U.S.A., Manila, P. I.
- 1896 Persons, Remus Charles, Medical Inspector (Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
- 1897 Pesold, Carl, Maj. and Surg., N.G.Mo., 1502 Wagoner Pl., St. Louis, Mo.
- 1900 Peters, Jacob Mark, 1st Lt. and Asst. Surg., N.G.Pa., Steelton, Pa.
- 1896 Pettigrew, George Atwood, Col. and Surg. Gen., N.G.S.Dak., Flandreau, S. Dak.
- 1901 Phelan, Henry du R., Capt. and Asst. Surg., U.S.V., Manila, P. I.
- 1897 Phillips, Albert William, Brig. Gen., Surg. Gen. (Ret.), C.N.G., Derby, Conn.
- 1900 Phillips, Frank I., Ex-Act. Asst. Surg., U.S.M.H.S., Escanaba, Mich.
- 1894 Phillips, John Leighton, Maj. and Surg. U.S.A., Maj. and Chief Surg. U.S.V., Manila, P. I.
- 1901 Pierce, Norval H., Lt. and P. A. Surg., Ill. N. M., 31 Washington St., Chicago, Ill.
- 1900 Pleadwell, Frank Lester, P. A. Surg. (Lt. j. g.), U.S. N., Care Navy Dept., Washington, D. C.
- 1897 Pope, Benjamin Franklin, Lt. Col. and Dep. Surg. Gen. U.S.A., Lt. Col. and Chief. Surg. U.S.V., Manila, P. I.
- 1894 Porter, Joseph Y., Maj. and Surg., S. T. Fla., Jacksonville, Fla.
- 1900 Pottleiger, George Frederick, 1st Lt. and Asst. Surg. N. G. Pa., Maj. and Surg. Pa. V. I., Hamburg, Pa.
- 1899 Powell, Seneca Daniel, Maj. and Brig. Surg., N.G.N.Y., 12 W. 40th St., New York, N. Y.
- 1894 Priestley, James Taggart, Brig. Gen. and Surg. Gen., Iowa, 707 E. Locust St., Des Moines, Ia.
- 1892 Pritchett, Gilbert L., Maj. and Surg., N. G. Neb., Fairbury, Neb.
- 1895 Purviance, William E., Capt. and Asst. Surg., U.S.A., Presidio, San Francisco, Cal.
- 1900 Ralston, B. Stewart, 1st Lt. and Asst. Surg., N. G. Pa., Penn. Ave., and Main St., Pittsburg, Pa.
- 1897 Rannels, David A., Maj. and Surg. O. V. I., Capt and Asst. Surg., O. N. G., McArthur, O.
- 1900 Raymond, Henry I., Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Pullman Bldg., Chicago, Ill.

ELECTED.

1898	Reed, Robert Harvey,	Col. and Surg. Gen. of Wyoming, Rock Springs, Wyo.
1894	Reed, Walter,	Maj. and Surg., U.S.A., Surg. Gen'l's Office, Washington, D. C.
1894	Reynolds, Frederick P.,	Capt. and Asst. Surg., U.S.A., Washington Barracks, D. C.
1898	Rhoads, Thomas Leidy,	1st Lt. and Asst. Surg., U.S.A., Manila, P. I.
1899	Richard, Charles,	Maj. and Surg., U.S.A., Fort Leavenworth, Kan.
1901	Richards, Josiah Williams,	Contract Surg., U.S.A., Fort Mott, Salem, N. J.
1896	Richards, Theodore W.,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1900	Richings, Henry,	Maj. and Surg., I.N.G., Rockford, Ill.
1895	Richardson, William Lambert,	Lt. Col. and Med. Dir., M.V.M., 225 Commonwealth Ave., Boston, Mass.
1897	Rieg, Philip S.,	Ensign and Asst. Surg., N.B., O.N.G., 338 Summit St., Toledo, O.
1900	Ritchie, Harry Parks,	1st Lt. and Asst. Surg., N.G., Minn., St. Paul, Minn.
1896	Ritter, F. Horace S.,	1st Lt. and Asst. Surg., N.G.N.Y., 314 E. Church St., Elmira, N. Y.,
1895	Rixey, Presley Marion,	Medical Inspector, (Comdr.), U.S.N., Naval Dispensary, Washington, D. C.
1898	Roberts, Thomas Elmer,	Capt. and Asst. Surg., I.N.G., Capt. and Asst. Surg., Ill.V.I., 144 S. Oak Park Ave., Oak Park, Ill.
1891	Robertson, Charles Moore,	Maj. and Surg. N.G.Ia., Maj. and Chief Surg., U.S.V., Davenport, Ia.
1893	Robins, Robert Patterson,	Capt. and Asst. Surg., U.S.V., 1st Lt. and Asst. Surg., N.G.Pa., 2110 Pine St., Philadelphia, Pa.
1900	Robinson, John Franklin,	Maj. and Surg. (Ret.), N.G.N.H., The Kinnard, Manchester, N.H.
1896	Rockwell, Thomas F.,	Maj. and Surg., C.N.G., Maj. and Surg., Conn.V.I., Rockville, Conn.
1894	Rolfe, William Alfred,	1st Lt. and Asst. Surg., M.V.M., 1st Lt. and Asst. Surg., Mass.V.H.A., 549 W. Newton St., Boston, Mass.
1901	Root, Matt R.,	Maj. and Surg., N.G.Colo., 1st Lt. and Asst. Surg., U.S.V.C., 209 Jackson Block, Denver, Colo.
1900	Rothert, William Henry,	Capt. and Asst. Surg., O.N.G., 1632 Freeman St., Cincinnati, O.



ELECTED.

1900	Rowe, Jesse,	Capt. and Asst. Surg., I.N.G., Capt. and Asst. Surg., Ill.V.I., Abingdon, Ill.
1901	Rowe, William H.,	1st Lt. and Asst. Surg., Minn.N.G., St. James, Minn.
1900	Runnels, Orange S.,	Col. and Surg. Gen., Ind.N.G., Indianapolis, Ind.
1901	Santoire, Henri Alexis,	Contract Surg., U.S.A., Fort Greble, Jamestown, R. I.
1895	Sawtelle, Henry Winchester,	Surg., U.S.M.H.S., Chicago, Ill.
1894	Schuyler, Clarkson C.,	1st Lt. and Asst. Surg. (Ret.), N.G.N.Y., Box 212, Plattsburg, N. Y.
1894	Scofield, Walter Keeler,	Med. Dir. (Capt. Ret.), U.S.N., Philadelphia, Pa.
1900	Seaman, Louis Livingston,	Maj. and Surg. U.S.V.E., 118 W. 31st St., New York, N. Y.
1900	Senn, William Nicholas,	1st Lt. and Asst. Surg., I.N.G., 532 Dearborn Ave., Chicago, Ill.
1893	Sevey, Harry Sheldon,	Capt. and Asst. Surg. (Ret.), N.G.S.D., Arizpe, Sonora, Mexico.
1894	Shannon, William C.,	Maj. and Surg. (Ret.), U.S.A., Elkhorn, Neb.
1894	Shaw, John Bliss,	Maj. and Surg., I.N.G., Maj. and Surg., Ill.V.I., Joliet, Ill.
1896	Shipp, Edward Mansfield,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1899	Shoemaker, John Veitch,	Col. and Surg. Gen. of Pennsylvania, 1519 Walnut St., Philadelphia, Pa.
1892	Silliman, James E.,	Maj. and Surg., N.G.Pa., 137 W. 8th St., Erie, Pa.
1901	Simonton, Albert H.,	Contract Surg., U.S.A., Fort Robinson, Neb.
1892	Simpson, James Edwin,	Maj. and Surg., M.V.M., 348 Essex St., Salem, Mass.
1897	Skene, William H.,	1st Lt. and Asst. Surg., M.G.N.Y., 143 Clinton St., Brooklyn, N. Y.,
1894	Skinner, John O.,	Maj. and Surg. (Ret.), U.S.A., Chambersburg, Pa.
1893	Smart, Charles,	Col. and Asst. Surg. Gen., U.S.A., 2017 Hillyer Pl., Washington, D. C.
1901	Smart, Robert,	1st Lt. and Asst. Surg., U.S.A., Fort Monroe, Va.
1895	Smith, Allen V.,	Capt. and Asst. Surg., O.N.G. Capt. and Asst. Surg., O.V.I., Canton, O.
1895	Smith, French W.,	1st Lt. and Asst. Surg., W.Va.S.T., Bluefield, W. Va.

ELECTED.

- 1895 Smith, George Tucker, Surg. (Lt.), U. S. N.,
Care Navy Dept., Washington, D. C.
- 1898 Smith, Reginald K., P. A. Surg. (Lt), U. S. N.,
Care Navy Dept., Wathington, D. C.
- 1893 Smith, William Lloyd, Maj. and Surg., I. N. G.,
306 S. Park St., Streator, Ill.
- 1900 Spence, Thomas Bray, Capt. and Asst. Surg., N. G. N. Y.,
Capt. and Asst. Surg. N. Y. V. I.,
139 7th Ave., Brooklyn, N. Y.
- 1897 Srodes, J. Lewis, Maj. and Surg., Pa. V. I.,
1st Lt. and Asst. Surg., N. G. Pa.,
742 Penna. Ave., Wilksnsburg, Pa.
- 1893 Standish, Myles, Capt. Com. Amb. Corps, M. V. M.,
6 St. James Ave., Boston, Mass.
- 1898 Stanton, Samuel Cecil, 1st Lt. and Asst. Surg., I. N. G.,
Assistant Secretary 1899-1901. Contract Surg., U.S.A.,
9 Cedar St., Chicago, Ill.
- 1897 Stark, William T., Lt. Col. and Asst. Adj. Gen., N. G. Mo.,
Kansas City, Mo.
- 1894 Stayer, Andrew Snowberger, Maj. and Surg. N. G. Pa.,
Maj. and Surg. Pa. V. I.,
1501 7th Ave., Altoona, Pa.
- 1898 Stedman, Joseph Cyrus, 2d Lt. Amb. Corps, M. V. M.,
116 Sedgwick St., Boston, Mass.
- 1897 Stephenson, Franklin Bache, Medical Inspector (Comdr.), U.S.N.,
Care Navy Dept., Washington, D.C.
- 1897 Stephenson, William, Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.
- 1893 Sternberg, George Miller, Brig. Gen. and Surg. Gen., U.S.A.,
President 1894-95. Washington, D. C.
- 1898 Steward, Edward Larkin, 1st Lt., and Asst. Surg., F.S.T.,
Starke, Fla.
- 1895 Stewart, Walter Scott, Maj. and Surg., Pa.V.I.,
1st Lt. and Asst. Surg., N.G.Pa.,
52 S. Franklin St., Wilkesbarre, Pa.
- 1901 Stieren, Edward, 1st Lt. and Asst. Surg., N.G.Pa.,
219 6th St., Pittsburgh, Pa.
- 1894 Stiles, Henry Ranney, Capt. and Asst. Surg., U.S.A.,
Manila, P. I.
- 1896 Stitt, Edward R., Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1899 Stone, Alexander J., Brig. Gen., Surg. Gen. (Ret.), Minnesota,
President 1900-or. Lowry Arcade, St. Paul, Minn.
- 1901 Stone, John Hamilton, Capt. and Asst. Surg., U.S.A.,
Matanzas, Cuba.
- 1900 Stoner, George W., Surg. U.S.M.H.S.,
Stapleton, Staten Island, N.Y.
- 1899 Stover, Bruce H., 1st Lt. and Asst. Surg., N.G.Ia.,
Carroll, Iowa.

ELECTED.

- 1891 Streeter, John Williams. Lt. Col. and Asst. Surg. Gen., I.N.G.,
2646 Calumet Ave., Chicago, Ill.
- 1897 Stroud, Harrison Edward, Col. and Surg. Gen. Arizona,
Phoenix, Ariz.
- 1896 Sullivan, Thomas J., Maj. and Surg., I.N.G.,
Maj. and Surg., Ill.V.I.,
4709 Michigan Ave., Chicago, Ill.
- 1901 Sweet, Charles F., Maj. and Surg., R.I.M.,
38 N. Union St., Pawtucket, R. I.
- 1896 Taneyhill, G. Lane, Maj. and Surg. (Ret.), N.G.Md.,
1103 Madison Ave., Baltimore, Md.
- 1894 Taylor, Walter L., Ex-Capt. and Asst. Surg., O.N.G.,
933 Grand Ave., Cincinnati, O.
- 1892 Terriberry, George W., Col. and Div. Surg., N.G.N.J.,
146 Broadway, Paterson, N. J.
- 1895 Terry, Marshall Orlando, Ex-Brig. Gen., Surg. Gen., N.G.N.Y.,
196 Genesee St., Utica, N. Y.
- 1893 Thayer, Frederick C., Col. and Surg. Gen., Me.V.M.,
119 Maine St., Waterville, Me.
- 1893 Thomson, Archibald G., Maj. and Surg. Pa.V.I.,
1st Lt. and Asst. Surg., N.G.Pa.
1426 Walnut St., Philadelphia, Pa.
- 1900 Thompson, Hiram Benson, Maj. and Surg. C.N.G.,
Maj. and Surg. Conn.V.I.,
New London, Conn.
- 1901 Thornburgh, Robert M., 1st Lt. and Asst. Surg., U.S.A.,
Fort Slocum, N. Y.
- 1899 Torney, George H., Maj. and Surg., U.S.A.,
Army and Navy General Hospital,
Hot Springs, Ark.
- 1899 Townsend, Joseph Hendley, Maj. and Surg., C N.G.,
39 College St., New Haven, Conn.
- 1900 Trecartin, David Munson, Ensign and Asst. Surg., N.B.,C.N.G.,
352 State St., Bridgeport, Conn.
- 1894 Tuholske, Herman. Maj. and Surg. N.G.Mo.,
410 N. Jefferson St., St. Louis, Mo.
- 1893 Turnbull, Charles Smith, Maj. and Surg., N.G.Pa.,
1935 Chestnut St., Philadelphia, Pa.
- 1896 Turner, William D., Maj. and Surg., Va.V.,
Fergusson's Wharf, Va.
- 1895 Tuttle, Jay, Act. Asst. Surg., U.S.M.H.S.,
Astoria, Oregon.
- 1894 Twitchell, Herbert Eugene, Capt. and Asst. Surg., O.N.G.,
Capt. and Asst. Surg., Ohio V.I.,
24 S. B St., Hamilton, O.
- 1900 Vaughan, George Tully, Surg. U.S.M.H.S.,
Maj. and Brig. Surg., U.S.V.,
816 17th St., Washington, D. C.
- 1895 Wakeman, William James, Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.

ELECTED.

- 1894 Wallace, David L., Maj. and Surg., N.G.N.J.,
192 Clinton Ave., Newark, N. J.
- 1896 Wallace, Henry, Maj. and Surg., N.Y.V.I.,
Capt. and Asst. Surg., N.G.N.Y.,
183 Congress St., Brooklyn, N. Y.
- 1899 Walls, Charles Bruce, 1st Lt. and Asst. Surg., I.N.G.,
1st Lt. and Asst. Surg., Ill.V.I.,
1003 Warren Ave., Chicago, Ill.
- 1900 Warbasse, James Peter, Capt. and Asst. Surg., N.G.N.Y.,
Ex-Acting Asst. Surg., U.S.A.,
68 Greene Ave., Brooklyn, N. Y.
- 1896 Ward, John M. Broomall, 1st Lt. and Asst. Surg., N.G.Pa.,
1st Lt. and Asst. Surg., Pa.V.I.,
Quarantine Station, Marcus Hook, Pa.
- 1897 Warfield, Ridgley Brown, Brig. Gen. and Surg. Gen., Maryland,
214 W. Franklin St., Baltimore, Md.
- 1896 Waters, William E., Lt. Col., Dep. Surg. Gen. (Ret.), U.S.A.,
Care Surg. Gen., Washington, D. C.
- 1893 Watson, Wilbur S., Lt. Col. and Med. Dir., C.N.G.,
66 West St., Danbury, Conn.
- 1896 Weaver, Clarence A., Capt. and Surg., N.G.D.C.,
1st Lt. and Asst. Surg., D.C.V.I.,
1614 Q. St. N. W., Washington, D. C.
- 1892 Weaver, Joseph K., Lt. Col. and Chief Surg., N.G.Pa.,
Maj. and Brig. Surg., U.S.V.,
Norristown, Pa.
- 1893 Wertenbaker, Charles Poindexter, P. A. Surg., U.S.M.H.S.,
New Orleans, La.
- 1897 Westervelt, William Alfred, Maj. and Surg., O.N.G.,
Assistant Secretary, 1897-99. Maj. and Surg., Ohio V.I.,
62 E. Broad St., Columbus, O.
- 1891 Wheaton, Charles A., Brig. Gen., Surg. Gen., (Ret.), Minn.,
326 Wabasha St., St. Paul, Minn.
- 1897 Wheaton, James Lucas, 1st Lt. Hosp. Corps, R.I.M.,
Summer St., Pawtucket, R. I.
- 1899 Whitcomb, Edward H., Maj. and Asst. Surg. Gen., N.G.Minn.,
199 E. 7th St., St. Paul, Minn.
- 1899 White, William Seymour, 1st Lt. and Asst. Surg., I.N.G.,
370 Warren Ave., Chicago, Ill.
- 1900 Whiting, Joseph B., jr., Maj. and Surg., Wis.N.G.,
1st Lt. and Asst. Surg., U.S.V.,
Janesville, Wis.
- 1897 Wieber, Francis Wm. Ferdinand, Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1891 Wilkie, Frederick J., Maj. and Surg., Wis.N.G.,
61 Merritt St., Oshkosh, Wis.
- 1897 Willard, William G., Maj. and Surg., I.N.G.,
Maj. and Surg., Ill.V.I.,
544 Washington Boul., Chicago, Ill.



REGISTER OF MEMBERS

39

ELECTED.

- 1895 Willcox, Charles, Maj. and Surg., U.S.V.,
Capt. and Asst. Surg., U.S.A.,
Manila, P. I.
- 1897 Williams, John Hey, Col. and Surg. Gen., North Carolina,
53 Haywood St., Asheville, N. C.
- 1897 Wilson, Charles E., Maj. and Surg., Mo.V.I.,
Capt. and Asst. Surg., N.G.Mo.,
906 Main St., Kansas City, Mo.
- 1898 Wilson, George Brinton, Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C.
- 1897 Wilson, James Sprigg, Maj. and Surg. U.S.V.,
Capt. and Asst. Surg., U.S.A.,
Manila, P. I.
- 1900 Wilson, William Henry, Capt. and Asst. Surg., U.S.A.,
Fort McDowell, Cal.
- 1891 Wilson, William W., Ex-Capt., Asst. Surg., Ind. Inf. Legion,
620 3d St., Wausau, Wis.
- 1894 Wise, John Cropper, Med. Dir. (Captain), U.S.N.,
First Vice-President 1900-1901.
Second Vice-President. 1897-99.
Care Navy Dept., Washington, D. C.
- 1896 Wood, Frederick John Jennings, Maj. and Surg., N.G.N.Y.,
199 DeKalb Ave., Brooklyn, N. Y.
- 1895 Wood, Marshall, William, Maj. and Surg., U.S.A.,
Jefferson Barracks, Mo.
- 1894 Woodhull, Alfred Alexander, Col. and Asst. Surg. Gen. (Ret.), U.S.A.,
Princeton, N. J.
- 1893 Woodruff, Charles Edward. Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Fort Riley, Kan.
- 1896 Woodruff, Ezra, Lt. Col. and Dep. Surg. Gen., U.S.A.,
Fort Hamilton, N. Y.
- 1896 Woods, George Worth, Med. Dir. (Capt. Ret.), U.S.N.,
Second Vice-President 1899-1900.
Care Navy Dept., Washington, D. C.
- 1898 Wright, Arthur Lee, Maj. and Surg., N.G.Ia.,
Carroll, Iowa.
- 1899 Wright, John William, Maj. and Surg., Pa.V.I.,
1st Lt. and Asst. Surg., N.G.Pa.,
18 E. 8th St., Erie, Pa.
- 1897 Wright, Thompson B., Capt. and Asst. Surg., O.N.G.,
Circleville, Ohio.
- 1894 Wyeth, Marlborough Churchill, Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Havana, Cuba.
- 1898 Wylie, Winfred, Col. and Surg. Gen., Arizona,
Phoenix, Ariz.
- 1901 Wyman, Walter, Supervising Surg. Gen., U.S.M.H.S.,
Honorary Member, 1892-1901.
Second Vice-President, 1901-1902.
Washington, D. C.
- 1894 York, George William, Maj. and Surg., N.G.N.Y.,
190 Franklin St., Buffalo N. Y.

ASSOCIATE MEMBERS.

- 1899 Adams, William Arnold, Ex-Lt. Col. and Med. Dir., Tex.V.G.,
Equitable Bldg., St. Louis, Mo.
- 1897 Asch, Morris J., Ex-Maj. and Surg., U.S.A.,
5 W. 30th St., New York, N. Y.
- 1898 Board of Officers, Sixty-Fifth Regt., N.G.N.Y.,
Buffalo, N. Y.
- 1897 Conner, Phineas S., Ex-Bvt. Maj. and Asst. Surg., U.S.A.,
215 W. 9th St., Cincinnati, O.
- 1901 Fox, Charles James. Brig. Gen. and Surg. Gen. (Ret.) C.N.G.,
Willimantic, Conn.
- 1894 Donnelly, Richard A., Brig. Gen. and Q. M. Gen., N. J.,
Trenton, N. J.
- 1900 Haller, John Frederick, 1st Lt. and Asst. Surg. (Ret.), R.I.M.,
623 Macon St., Brooklyn, N. Y.
- 1897 Hamilton, Charles S., Ex-Capt. and Asst. Surg., O.N.G.,
142 E. Long St., Columbus, O.
- 1897 Hart, Hugh A., Ex-Brig. Gen. and Surg. Gen., O.N.G.,
Wooster, O.
- 1897 Manley, Thomas H., Ex-Capt. and Asst. Surg., U.S.V.,
115 W. 49th St., New York, N. Y.
- 1901 Marcy, Henry Orlando, Lt. Col. and Med. Dir., U.S.V. (Civil War),
180 Commonwealth Ave., Boston, Mass.
- 1892 Moore, Milton, Brig. Gen. Comdg. 1st Brig., N.G.Mo.,
N. Y. Life Bldg., Kansas City, Mo.
- 1896 Morris, Henry, Ex-1st Lt. and Asst. Surg., N.G.Pa.,
313 S. 16th St., Philadelphia, Pa.
- 1896 Osgood, Frederick Huntington, 1st Lt. and Vet. Surg., M.V.M.,
50 Village St., Boston, Mass.
- 1894 Sander, Enno, Ex-Maj. and Brig. Q. M. Enr. Mo. Mil.,
129 S. 11th St., St. Louis, Mo.
- 1899 Southard, William Freeman, Ex-Maj. and Surg., M. V. M.,
1220 Sutter St., San Francisco, Cal.
- 1894 Spencer, Bird Wilson, Brig. Gen., Ins. Gen. R. P., N.G.N.J.,
Passaic, N. J.
- 1899 Trader, John Wesley, Ex-Maj. and Surg., N.G.Mo.,
Sedalia, Mo.
- 1894 Truax, Charles, 44 Wabash Ave.,
Chicago, Ill.
- 1896 Van Pelt, Joseph K. T., Ex-Maj., Brig. Surg., U.S.V., (Civil War.),
1529 Spruce St., Philadelphia, Pa.
- 1896 Wagner, Clinton, Ex-Bvt. Lt.-Col. and Surg., U.S.A.,
19 E. 38th St., New York, N. Y.
- 1897 Whitaker, Hervey Williams, Ex-P. A. Surg. (Lt.), U.S.N.,
72 Grant Ave., Columbus, O.
- 1900 Wirt, William Edgar, Lt. Comdr., N.B., O.N.G.,
Ex-Lt., U.S.N.,
477 Prospect St., Cleveland, O.
- 1896 Younger, William J., Ex-Col. and Med. Dir., N.G.Cal.,
200 Stockton St., San Francisco, Cal.

CORRESPONDING MEMBERS.

ELECTED.

- 1899 Sir W. Mitchell Banks, M.D., 28 Rodney St., Liverpool, England.
F.R.C.S.,
- 1899 Surg. Lt. Col. Fred W. Borden, Minister of Militia and Defense,
Ottawa, Canada.
- 1897 General Epifanio Cacho, General Jefe del Cuerpo Medico Militar
Mexicano (Surg. Gen. Mexican Army),
Ciudad Mexico, Mexico.
- 1897 Captain Hans Daal, Sanitary Captain, Norwegian Army,
Christiania, Norway.
- 1900 Major Narciso del Rio, Cuerpo Medico Militar Mexicano,
Vera Cruz, Mexico.
- 1892 Medicinalrad Edvard Martin Ofverfaltlakare vid armeen,
Edholm, (Surg. Gen. Swedish Army),
Stockholm, Sweden.
- 1897 Surgeon Captain Rory Fletcher, Ex-Surg., Central London Rangers,
Care Capt. A. K. Fletcher, Hillcroome,
Sutton, Surrey, England.
- 1892 General Thien Ho, Med. Inspector General Siamese Army,
Bangkok, Siam
- 1897 Docent Dr. Otokar Kukula, K. K. Assistenzarzt,
(Asst. Surg., Austro-Hungarian Army),
Prague, Austro-Hungary.
- 1897 Coronel Fernando Lopez, Coronel Medico Ciruj., Director Hosp. de
Mexico (Col. and Dir. Hosp. of Instruc-
tion, Mexican Army)
Ciudad Mexico, Mexico.
- 1899 Surg. Col. William McWatters, Royal Army Medical Corps,
Care Holt & Co., 3 Whitehall Place,
London, England.
- 1899 Tente. Cor. Zacharias R. Molina, Cuerpo Medico Militar Mexicano,
Vera Cruz, Mexico.
- 1900 Surg. Lieut. Col. J. L. H. Neilson, Dir. Gen., Med. Dept., Canadian Militia,
Ottawa, Canada.
- 1896 Professor Nicolaysen, University of Norway,
Christiania, Norway.
- 1897 General William Silver Oliver. Dep. Surg. Gen., British Army M. D.,
127 South Park St., Halifax, N. S.
- 1892 Sir J. O'Neil, C. B., Surg. Gen. (Ret.), Indian Med. Service,
London, England.
- 1892 Dr. Adolph Alexandrovitch Remert, Inspecteur général de service de santé
militaire, Ingénieriaia and Bolchaia Sa-
dovaia Streets,
St. Petersburg, Russia.
- 1899 Dr. Karl Rudberg, Staff Surgeon Swedish Navy,
Stockholm, Sweden.
- 1892 Surg. Lt. Col. George Sterling Dep. Surgeon General, Canadian Militia,
Ryerson, 60 College St., Toronto, Ontario.

- 1892 Generalmajor Johan Frederik Sanitetsgeneral og Chef, Kongelige
Thaulow, Regjerings Forsvars-Department,
(Surgeon General Royal War Ministry),
Christiania, Norway.
- 1899 Lt. Commander Dr. Tomat Suri, Surgeon, Imperial Japanese Navy,
Tokyo, Japan.
- 1892 M. G. M. F. Vanderlinden, Inspecteur général de service de santé
militaire,
Saint-Josseten-Noode, Belgium.
- 1891 General Stabsarzt, Prof. Dr. E. Geheimer Med. Rath (Surgeon General,
von Bergmann, 1st Class, Brigadier General),
Kriegs Ministeriums, Berlin, Germany.
- 1892 Excellenz General Stabsarzt der Chef der Medizinal Abtheilung des Kriegs
Armee, Prof. Dr. von Coler, Ministeriums (Surgeon General, German
Army, Chief of the Medical Section of
the War Ministry, Major General.)
Kriegs Ministeriums, Berlin, Germany.
- 1891 General Stabsarzt, Prof. Dr. Fr. Geheimer Med. Rath (Surgeon General
von Esmarch, 1st Class, Brigadier General),
Kiel, Germany.
- 1892 Excellenz Generalarzt, Dr. Eduard Chef der Med. Abtheilung in Königl.
von Fichte, Württembergischen Kriegs Minister-
iums, (Surgeon General, 1st class, Chief
of the Medical Section of the Royal
Württemberg War Ministry).
Stuttgart, Germany.
- 1892 Colonel Adolf Ziegler, Médecin en chef de l'armée fédérale
Suisse, Departement militaire,
Berne, Switzerland.



HONORARY MEMBERS.

ELECTED.

1899	Barton, Miss Clara,	Prest. Am. National Red Cross Assn., Glen Echo, Md.
1894	Book, James B.,	Lt. Col. and Surg. Gen. (Ret.), M.S.T., 33 Campau Bldg., Detroit, Mich.
1894	Brinton, John H.,	Ex-Maj., Brig. Surg., U.S.V. (Civil War), 1423 Spruce St., Philadelphia, Pa.
1900	Byers, Frederick Weils, <i>Active Member, 1891-1900.</i>	Brig. Gen., Surg. Gen. (Ret.), Wis.N.G., Monroe, Wis.
1901	Fenger, Christian,	Lt. and Asst. Surg. (Ret.), Danish Army, 269 Lasalle Ave., Chicago, Ill.
1895	Flint, Austin,	Ex-Surg. Gen. of New York, Ex-Act. Asst. Surg., U.S.A., (Civil War) 60 E. 34th St., New York, N. Y.
1900	Gihon, Albert Leary, <i>Active Member 1892-1900, Second Vice-President, 1894-95, First Vice-President, 1895-96, President-1896-97.</i>	Medical Director (Commodore Ret.), United States Navy, Reform Club, New York, N. Y.
1899	Gould, Miss Helen Miller,	Asst. Dir. Gen. Woman's National War Relief Association. Irvington-on-Hudson, N. Y.
1891	Henrotin, Fernand,	Maj. and Surg. (Ret.), I.N.G., 353 La Salle Ave., Chicago, Ill.
1897	Humiston, William Henry,	Ex-Pres. Ohio State Medical Society, 122 Euclid Ave., Cleveland, O.
1891	Irwin, Bernard John Dowling,	Col. and Asst. Surg. Gen. (Ret.), U.S.A., Cobourg, Ontario.
1894	Keen, William Williams,	Ex-Act. Asst. Surg., U.S.A., (Civil War), 1729 Chestnut St., Philadelphia, Pa.
1892	Kimball, Abner D.,	Maj. and Surg., Nat. Mil. Home, National Military Home, Ind.
1897	Kober, George Martin,	Ex-Act. Asst. Surg., U.S.A., 1819 Q St. N. W., Washington, D. C.
1894	Love, Isaac Newton,	Lt. Col. and Med. Dir. (Ret.), N.G.Mo., Cor. Euclid and Md. Aves., St. Louis, Mo.
1899	McGee, Dr. Anita Newcomb,	Ex-Act. Asst. Surg., U.S.A., (Span. War), 1620 P St., Washington, D. C.
1892	McIntyre, John H.,	Maj. and Surg. (Ret.), Ind. Inf. Leg., 931 N. Sarah St., St. Louis, Mo.
1899	Merrill, Mrs. John F.,	Prest. San Francisco Red Cross Society, San Francisco, Cal.
1894	Mills, Hiram R.,	Lt. Col. and Surg. Gen. (Ret.), Mich., Port Huron, Mich.
1895	Moore, John,	Brig. Gen. and Surg. Gen., (Ret.), U.S.A., 903 16th St. N. W., Washington, D. C.
1895	Murray, Robert,	Brig. Gen. and Surg. Gen. (Ret.), U.S.A., Castle Creek Hot Springs, Ariz.
1895	Page, Charles,	Col. and Asst. Surg. Gen. (Ret.), U.S.A., 340 Dolphin St., Baltimore, Md.

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| 1895 | Park, Dr. Roswell, | Prof. of Surgery, Univ. of Buffalo,
510 Delaware Ave., Buffalo, N. Y. |
| 1895 | Smith, Joseph Rowe, | Col. and Asst. Surg. Gen. (Ret.), U.S.A.,
2300 Delancy Pl., Philadelphia, Pa. |
| 1895 | Tryon, James Rufus, | Med. Dir. (Rear Admiral, Ret.), U.S.N.,
Care Navy Dept., Washington, D. C. |
| 1900 | Van Reypen, William K., | Surg. Gen., (Rear Admiral), U.S.N.,
Washington, D. C. |
| 1899 | Walworth, Mrs. Ellen Hardin, | Dir.Gen. Woman's Nat. War Relief Assn.,
5212 68th St., N. Y. |
| 1896 | Wilson, Dr. Ezra Herbert, | Director of the Hoagland Laboratory,
194 Keap St., Brooklyn, N. Y. |



Deceased Members.

Active Members.

DIED.

1898	Adams, Charles W.,	Lt. and Asst. Surg., N.G.Mo.,
1899	Armstrong, Francis Caldo,	Maj. and Surg. N.G.Kan.
1898	Bates, Newton L.,	Surg. Gen. (Commodore), U.S.N.
1900	Bergen, Andrew Conover,	Lt. Col. and Dep. Surg. Gen, N.G.Ia.
1898	Boardman, Walter.,	Lt. and Asst. Surg., N.G.Pa.
1900	Brooke, Benjamin,	Capt. and Asst. Surg., U.S.A.,
1894	Browne, John Mills,	Surg. Gen. (Commodore), U.S.N.
1901	*Crawford, Samuel K.,	Maj. and Surg., N.G.Mo.
1901	*Daly, William Henry,	Maj. and Chief. Surg., U. S.V.
1891	Eggers, John T.,	Capt. and Asst. Surg., N.G.Mo.
1901	Egle, William Henry,	Maj. and Surg., N.G.Pa.
1899	Etheridge, James Henry,	Maj. and Brig. Surg., I.N.G.
1898	Farquhar, Emmer C.,	Maj. and Surg., O.N.G.
1896	Fisher, Walter Wm. Roscoe,	Capt. and Asst. Surg., U.S.A.
1896	Forster, Edward Jacob,	Brig. Gen. and Surg. Gen., M.V.M.
<i>First Vice President 1896-97,</i>		
1900	Gauntt, Franklin,	Lt. Col. and Surg., N.G.N.J.
1892	Halbert, J. E.,	Col. and Surg. Gen., Mississippi.
1898	Hamilton, John B.,	Surg. Gen., U.S.M.H.S.
1894	Hayes, Charles,	Lt. Col. and Med. Dir., R.I.M.
1898	Helm, Scott,	Col. and Surg. Gen., N.G.Ariz.
1896	Hope, James Shirley,	P. A. Surg. (Lt.), U.S.N.
1897	Hutton, Wm. Henry Harrison,	Surg., U.S.M.H.S.
1893	Jessup, Robert B.,	Col. and Surg. Gen., Indiana.
1893	Leach, Hamilton E.,	Capt. and Asst. Surg., N.G.D.C.
1897	Lincoln, Frank T.,	Maj. and Med. Insp., Ga.V.
1896	Macauley, Carter N. Berkeley,	Capt. and Asst. Surg., U.S.A.
1891	Matthews, Frederick L.,	Col. and Surg. Gen., Illinois.
<i>Secretary 1892-93.</i>		
1898	McElderry, Henry,	Maj. and Surg., U.S.A.
1900	Miller, Truman W.,	Maj. and Surg., I.N.G.
1900	Mudge, Selden J.,	Lt. and Asst. Surg., N.G.N.Y.
1899	Munday, Benjamin,	Capt. and Asst. Surg., U.S.A.
1894	Murphy, John Henry,	Brig. Gen. and Surg. Gen., Minnesota.
1896	Ottlie, Charles,	Act. Asst. Surg., U.S.M.H.S.
1896	Pickman, H. Derby,	Brig. Gen. and Surg. Gen., Montana.
1901	Piggott, Michael Royston,	P. A. Surg. (Lt.), U.S.N.
1901	Porter, Alexander Shaw,	Capt. and Asst. Surg., U.S.A.

* Died since last meeting.

DIED.

- 1900 Read, Louis W., Col. and Surg. Gen., Pennsylvania.
President. 1895-96.
First Vice-President 1894-95.
Second Vice-President 1893-94.
- 1899 Robinson, Samuel Quincy, Maj. and Surg., U.S.A.
- 1899 Rohé, George Henry, Maj. and Surg., N.G.Md.
- 1897 Sanborn, Perley Putnam, Capt. and Asst. Surg., Ind. Inf. Legion.
- 1900 Siegfried, Charles A., Med. Insp. (Comdr.), U.S.N.
- 1898 Smith, Lawrence Savery, Maj. and Surg., N.G.Pa.
- 1901 *Tesson, Louis S., Maj. and Surg., U.S.A.,
- 1897 Vaughan, Bolivar Alvearr, Lt. Col., Asst. Surg. Gen., Miss. N.G.
- 1901 *Ward, Milo Buel, Maj. and Surg., N.G.Mo.
- 1896 Woodward, Charles Meredyth, Lt. Col. and Surg. Gen., Michigan.
Sec. Vice-President 1892-93.
- 1896 Worthington, James Cheston, Maj. and Surg., U.S.A.

Associate Members.

- 1901 Grove, John H., Brev. Lt. Col., Surg., U.S.V. (Civil War).
- 1897 Ordway, Albert, Brig. Gen., Commanding N.G.D.C.

Corresponding Members.

- 1896 M. Feraud Berenger, Med. Dir., Marine M. Service, France.
- 1897 Gen. Darby Bergin, M. P. Dir. Gen. Med. Dep. Canadian Militia.
- 1895 M. Leon Jean Colin, Med. Inspector General, France.
- 1897 Sir Wm. A. Mackinnon, K. C. B. Maj. Gen. and Dir. Gen., R. A. M. D.
- 1896 Giacomo Pecco, Insp. Gen., Army Med. Service, Italy.
- 1897 Frederick William Strange, Dep. Surg. Gen. Canadian Militia.
- 1894 M. R. Timmerman, Insp. Gen., Army Med. Serv., Holland.

Honorary Members.

- 1894 Abbett, Leon, Governor of New Jersey.
- 1897 Leighton, Walter H. Surgeon, Milwaukee Soldiers' Home.
- 1893 McClellan, Ely, Lt. Col. and Dep. Surg. Gen., U.S.A.
- 1894 Porter, Josiah, Maj. Gen. and Adj. Gen., N.G.N.Y.,
- 1892 Roth, Wilhelm A., Surgeon General, of Saxony.
- 1895 Sutherland, Charles, Brig. Gen. and Surg. Gen., U.S.A.

*Died since last meeting.



Minutes of the Meeting.

THE TENTH annual meeting of the Association of Military Surgeons of the United States convened in the Chamber of the House of Representatives of the Minnesota State Capital, on Thursday, Friday and Saturday, May 30 and 31 and June 1, 1901, the President, Brigadier General ALEXANDER J. STONE, Surgeon General, Retired, of Minnesota, in the Chair, and the following members in attendance:

Lt. Col. Charles Adams, Asst. Surg. Gen., I.N.G.
Col. O. W. Archibald, Surg. Gen. N.G.N.D.
Lieut. H. A. Arnold, Asst. Surgeon, N.G.Pa.
Brig. Gen. Robert A. Blood, Surgeon General, M.V.M.
Med. Dir. Delavan Bloodgood, Med. Dir. (Captain Ret.), U.S.Navy.
Capt. A. E. Bradley, Asst. Surgeon, U.S Army.
Major Albert H. Briggs, Surgeon, N.G.N.Y.
Lieut. J. L. Brubaker, Asst. Surgeon, N.G.Pa.
Brig. Gen. Fred. W. Byers, Surgeon General (Ret.), N.G.Wis.
Major Morris F. Cawley, Surgeon, N.G.Pa.
Major T. C. Clark, Surgeon, N.G.Minn.
Brig. Gen. George Cook, Surg. Gen. (Ret.), N.G.N.H.
Capt. Geo. M. Coon, Asst. Surgeon N.G.Minn.
Lieut. John H. Dorsey, Asst. Surgeon, N.G.Minn.
Major C. E. Dutton, Surgeon N.G. Minn.
Brig. Gen. J. B. Edwards, Surgeon General, N.G. Wis.
Colonel Carroll D. Evans, Surgeon General, N.G.Neb.
Major T. W. Evans, Surgeon, N.G. Wis.
Major David S. Fairchild, Surgeon, N.G.Iowa.
Lieut. Christian Fenger, Asst. Surgeon (Ret.), Danish Army.
Lt. Col. R. J. Fitz Gerald, Med. Director, N.G.Minn.
Lt. Col. Francis C. Ford, Med. Director, T.V.G.
Lt. Col. Chas. H. French, Med. Director, R.I.M.
Lieut. Asa F. Goodrich, Asst. Surgeon, N.G.Minn.
Col. W. W. Grant, Surgeon General of Colorado.
Brig. Gen. J. D. Griffith, Med. Dir. (Ret.), N.G.Mo.
Major Geo. Halley, Brigade Surgeon, N.G.Mo.
Lieut. R. K. Hutchings, Asst. Surgeon, N.G.Colo.
Major W. Jacoby, Surgeon, N.G.Minn.

Dr. Geo. M. Kober, Ex-A. A. Surgeon, U.S.A.
 Col. Edward W. Lee, Ex-Surg. Gen., N.G.Neb.
 Lt. Col. Henry O. Marcy, Ex-Med. Dir. U.S.V.
 Major S. C. Milligan, Brigade Surgeon, N.G.Pa.
 Major R. W. Montelius, Surgeon, N.G.Pa.
 Lt. Col. Chas. F. W. Myers, Med. Director, N.G.N.J.
 Brig. Gen. James T. Priestley, Surgeon General of Iowa
 Col. R. Harvey Reed, Surgeon General of Wyoming.
 Major Charles Richard, Surgeon, U.S.Army.
 Major Matt. R. Root, Surgeon, N.G.Colo.
 Captain Thos. E. Roberts, Asst. Surgeon, I.N.G.
 Lieut. W. H. Rowe, Asst. Surgeon, N.G.Minn.
 Major Enno Sander, Ex-Major, U.S.V.
 Major Louis L. Seaman, Surgeon U.S.Vol.Eng'rs.
 Lieut. S. C. Stanton, Asst. Surgeon, I.N.G.
 Brig. Gen. A. J. Stone, Surgeon General (Ret.), N.G.Minn.
 Mr. Charles Truax, Chicago, Illinois.
 Major George T. Vaughan, Surgeon, U.S.M.H.S.
 Lt. Col. W. S. Watson, Medical Director, N.G.Conn.
 Lt. Col. Joseph K. Weaver, Surgeon in Chief, N.G.Pa.
 P. A. Surg. C. P. Wertenbaker, U.S.M.H.S.
 Captain Allen A. Wesley, Asst. Surgeon, I.N.G.
 Brig. Gen. C. A. Wheaton, Surgeon General (Ret.) N.G.Minn.
 Major E. H. Whitcomb, Asst. Surg. Gen., N.G.Minn.
 Major A. L. Wright, Surgeon, N.G.Iowa.

FIRST SESSION, THURSDAY MORNING MAY 30, 1901

The opening session of the Association was called to order by GEN. JOHN F. FULTON, of St. Paul, Chairman of the Committee of Arrangements, at 10 o'clock A. M., in the State Capitol.

The meeting was opened with an invocation by the Most Rev. JOHN IRELAND, Archbishop of St. Paul.

Gen. Fulton then introduced GOVERNOR S. R. VAN SANT who delivered an address of welcome on behalf of the state.

JUDGE E. A. JAGGARD of St. Paul, then welcomed the Association on behalf of the city.

The President's annual address by BRIGADIER GENERAL ALEXANDER J. STONE followed.

The regular routine of business was then taken up and the Secretary read a telegram conveying the greetings and

good wishes of the Association of Medical Officers of the Army and Navy of the Confederacy, as follows:

MEMPHIS, TENN., May 28, 1901.

ALEX. J. STONE, M. D.,

St. Paul.

The Association of medical officers of the Army and Navy of the Confederacy now in session sends cordial and fraternal greetings to the Association of Surgeons of the Army and Navy of the United States.

[Signed]

JAMES M. KELLER,

President.

On motion of MAJ. T. C. CLARK., Minn., the telegram was ordered placed on file and the Secretary instructed to make a suitable reply. Pursuant to instruction the following message was transmitted to President Keller:

ST. PAUL, MINN., June 1, 1901.

Col. JAMES M. KELLER, Prest.,

Memphis, Tenn.

The Association of Military Surgeons of the United States sends cordial greetings to the Medical Officers of the army and navy of the Confederacy and by unanimous action welcomes them to membership in this body. Governor Van Sant heartily endorses and approves.

[Signed]

ALEX. J. STONE.

President.

LIEUT. COL. CHAS. ADAMS, Ill., Secretary, submitted his annual report.

On motion of BRIG. GEN. J. T. PRIESTLY, Iowa, the report was adopted and ordered placed on file.

LIEUT. H. A. ARNOLD, Pa., Treasurer, presented his annual report.

MAJ. T. C. CLARK, Minn., moved that the report of the Treasurer be referred to the Auditing Committee.

COL. R. H. REED, Wyo.—I wish to make a few remarks right here in regard to this matter of dues for 1898. It was decided at Kansas City that we would collect dues for the year in which we had no meeting. It is presumable that men who were there and voted on the motion were willing to pay their dues that year, but there was a great body of men who were not there. Quite a large proportion of those members would not have agreed to that proposition, and I would suggest that

the Auditing Committee be instructed to bring in a recommendation in regard to the dues of 1898. I think if we take into consideration the fact that many men were unable to pay dues that year we shall look at this matter in a different light. I would suggest that those men who paid their dues in 1898 be credited with them, and that those who have not paid them be relieved from the payment of dues for that year. We have money in the treasury, and those men cannot see just why the dues of that year should be collected, and I am convinced that one reason why there are so many delinquents is the fact of the non-payment of dues for that year. In the motion to refer to the Auditing Committee I would suggest that there be included an instruction to canvass the subject and bring in a recommendation regarding that matter.

LIEUT. COL. J. D. GRIFFITH, Mo.—May I amend that motion by asking that the Auditing Committee do not report at present; I mean until probably the last business meeting. There are several things which should properly come up in the recommendations from this committee that I think should be very thoroughly discussed here, especially so since a great many changes may be made in our by-laws which could be included in the Auditing Committee's report. For this reason I would like to have the report of the Auditing Committee deferred as late as possible. I offer this as an amendment to Maj. Clark's motion.

The amendment was accepted by Maj. Clark.

The motion of MAJ. CLARK as amended was then put to a vote and unanimously prevailed.

LIEUT. COL. CHAS. ADAMS, Chairman, submitted the report of the Publication Committee.

On motion of COL. R. H. REED, Wyoming, the report was received and adopted.

MAJ. A. H. BRIGGS, Chairman, presented a report on behalf of the Committee on Transportation.

On motion of COL. R. H. REED the report of the committee was received and adopted.

LIEUT. COL. ADAMS, Secretary, reported that no papers

had been presented in competition for the Enno Sander prize and consequently there would be no award.

The report of the Journal Committee being next in order, the President announced that at the last moment Col. Shoemaker, the Chairman, found it impossible to be present at the meeting, and directed that the next member in order act in behalf of the chairman.

P. A. SURG. CHAS. P. WERTENBAKER, U. S. M. H. S., announced that as a member of the Journal Committee he was thoroughly familiar with its actions and with the work the committee had done.

On motion of MAJ. T. C. CLARK, Minn., the report of the committee was deferred until a later session.

The President appointed an Auditing Committee consisting of the following members:

Brig. Gen. J. T. Priestly, Iowa.

Maj. T. C. Clark, Minnesota.

Col. R. Harvey Reed, Wyoming.

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the President was instructed to appoint the Nominating Committee immediately upon convening of the afternoon session.

On motion of MAJ. T. C. CLARK, Minn., the meeting adjourned until 2:30 p. m.

SECOND SESSION, THURSDAY AFTERNOON, MAY 30, 1901.

The meeting was called to order by the President at 3:00 P. M.

The Executive Committee submitted a report through the Secretary, LIEUT. COL. CHAS. ADAMS.

On motion of COL. J. D. GRIFFITH, Mo., the report of the committee was received.

On motion of MAJ. A. H. BRIGGS, N. Y., the report was adopted as read.

The Executive Committee having recommended that Dr. Christian Fenger, of Chicago, be made an honorary member of the Association, on motion of MAJ. A. H. BRIGGS, N. Y., the rules were suspended and the secretary instructed to cast

the unanimous ballot of the Association in favor of Dr. Fenger as an honorary member.

The business of the afternoon session being concluded, the literary program was taken up with a paper on "A Plea for Immediate Coeliotomy in Perforating Gunshot Wounds of the Abdomen in War," by CAPTAIN CHARLES E. B. FLAGG, Asst. Surg. U. S. A. In the absence of Capt. Flagg the paper was read by Lieut. Col. John Van R. Hoff.

The paper was discussed by Lieut. Col. J. D. Griffith, Lieut. Col. R. J. Fitz Gerald and Lieut. Col. J. V. R. Hoff.

A paper upon "Suprapubic Operation for Varicocele and Other Conditions Occurring within the Scrotum Requiring Surgical Interference," was read by MAJ. A. E. BRADLEY, Medical Department, U. S. A. The paper was discussed by Major T. C. Clark, Lieut. Col. J. D. Griffith, Col. E. W. Lee, Gen. F. W. Byers, Col. R. H. Reed, Lieut. R. K. Hutchings, Lieut. Col. J. V. R. Hoff, Major Geo. Halley, P. A. Surg. C. P. Wertenbaker, Gen. J. T. Priestley and Dr. Ch. Fenger.

THE PRESIDENT.—We have present with us a gentleman whom in honoring by making him an honorary member of this Association you have honored yourselves, and I take great pleasure in introducing to the Association of Military Surgeons, Prof. Christian Fenger. (Applause.)

DR. CHRISTIAN FENGER.—Mr. President and Members of the Association of Military Surgeons of the United States: I wish to say, that I feel very keenly the honor you have just conferred upon me. My love for military surgeons is an old one; it is over thirty-six years old, inasmuch as the first war I participated in was in 1864. It did not take long for me, as well as everybody else, years before I came over here to be one of you, to have my admiration aroused for what military surgery in America had done, for the record of the War of the Rebellion towers far above anything that has heretofore been written as a record of military surgery. It stands as a model for the admiration of all. As a consequence I feel still more deeply the honor and satisfaction to be allowed to take a part in the deliberations and to be made a fellow of the Associ-

ation of Military Surgeons of our country that has done the best work in that line that has ever been done. Gentlemen, I thank you. (Applause.)

On motion of MAJ. T. C. CLARK, Minn., the announcement of the Nominating Committee was postponed until the first order of business of the Friday morning session.

On motion of COL. R. H. REED, Wyo., the meeting adjourned until Friday morning at 10 o'clock.

THIRD SESSION, FRIDAY MORNING, MAY 31, 1901.

The Association was called to order at 10:15 A. M. by the President.

The President announced as the first order of business under the resolution of the previous session the announcement of the apportionment of votes for members of the Nominating Committee from different states.

The apportionment was then read by the Secretary.

APPORTIONMENT OF VOTES TO THE STATES AND SERVICES REPRESENTED BY ACTIVE MEMBERS PRESENT AT THIS MEETING.

	Members.	Votes.
Army	75	8
Colorado	6	1
Connecticut	13	2
Illinois	26	4
Iowa	7	2
Marine Hospital Service	12	2
Massachusetts	18	3
Minnesota	13	2
Missouri	14	2
Nebraska	4	1
New Hampshire	2	1
New Jersey	9	1
New York	33	4
North Dakota	1	1
Pennsylvania	35	4
Rhode Island	13	2
Wisconsin	8	2
Wyoming	1	1

The Committee on Necrology through its Chairman, BRIG. GEN. GEO. COOK, New Hampshire, submitted a report.

On motion of COL. J. D. GRIFFITH, Mo., Gen. Cook was instructed to continue the necrological report, and, within sixty days of the adjournment of the Association, to place the completed report in the hands of the Secretary for publication in the proceedings.

At the request of the President MAJ. A. H. BRIGGS, N. Y., took the chair.

The literary program was resumed by the reading of a paper upon "Observations in China and the Tropics on the Army Ration and the Post Exchange or Canteen," by MAJ. LOUIS L. SEAMAN, U. S. V. E.

The reading of the paper evoked a very animated and lengthy discussion, participated in by Col. W. W. Grant, Col. R. H. Reed, Gen. F. W. Byers, Lieut. Col. J. D. Griffith, Maj. T. C. Clark, Maj. Geo. Halley, Maj. A. A. Wesley, Lieut. Col. J. V. R. Hoff, and Gen. Geo. Cook.

MAJ. T. C. CLARK, Minn., moved that the paper be referred to the Publication Committee, and it was so ordered.

MAJ. L. L. SEAMAN then presented the following preamble and resolution relative to the subject:

Whereas, the Association of Military Surgeons of the United States now in session at St. Paul, recognizes that the abolition of the Army Post Exchange or Canteen has resulted, and must inevitably result, in an increase of intemperance, insubordination, discontent, desertion and disease in the Army, Therefore, be it

Resolved, that this body deplores the action of Congress in abolishing the said Post Exchange or Canteen, and, in the interests of sanitation, morality and discipline, recommends its reestablishment at the earliest possible date.

After an extended and thorough discussion the resolution, on motion of MAJ. T. C. CLARK, Minn., was unanimously adopted.

COL. R. H. REED, Wyoming, submitted the following supplementary resolutions:

Resolved, That it is the sense of this Association to resolve its members in each state into a special committee to confer with their congressional representatives and senators and interest them in the repeal of the so-called "canteen law."

Resolved, That a committee of seven, representing the U. S. Army, the Navy, the Marine Hospital Service and the members of this Association, be appointed to confer with a committee from the House of Representatives and Senate in reference to the matter.

The President, GEN. A. J. STONE, resumed the chair.

COL. R. H. REED, Wyo., moved the adoption of the resolution.

BRIG. GEN. GEO. COOK, N. H.—In the interest of combining effort I would suggest that the resolutions be referred to the committee on national legislation which is auxiliary to the American Medical Association, and which will meet in Washington and have charge of all such matters.

COL. R. H. REED, Wyo.—I will be very glad to accept the suggestion of Gen. Cook and add to the resolution:

Resolved, That a copy of this resolution be sent to the Committee on National Legislation of the American Medical Association and with a request to cooperate with us, and

Resolved, That a sufficient number of copies of the paper be printed to furnish a copy to each representative and senator, and that a member of the association shall be designated to see that the copies are properly distributed.

GEN. J. T. PRIESTLEY, Iowa.—There is only one objection to the committee proposed under Col. Reed's resolution, it is too large. A committee of seven is much more unwieldy than a committee of three or four. You can do much more work with a smaller committee.

COL. R. H. REED, Wyo.—I have no objection to cutting it down. I will make the number three.

MAJOR L. L. SEAMAN, U. S. V. E.—If it meet the approval of this Association I would suggest that this same resolution be presented to the American Medical Association for their approval with the endorsement of this Association.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—There is one question I would like to ask in regard to the resolution introduced by Maj. Seaman. If, by a peculiar combination of circumstances, the American Medical Association should refuse to pass that resolution what would be our status in regard to the joint action between the committee and the committee on legislation? It is safe to assume that they will pass it, but we have no alternative.

COL. R. H. REED, Wyo.—It is not the idea that we are to

act conjointly; we simply ask them to "cooperate with us." We have passed our resolution, we stand on record, but we simply ask them to act with us on the same measure. Our idea is to have the committee appointed and act with the committee from the House and Senate. Of course, if the committee on legislation of the American Medical Association cooperate with us we would act together with those committees. If they refuse to act with us our committee will act with the committee of the house and senate the same as though the other committee had not been asked to cooperate with us.

A vote being taken the resolutions offered by Col. Reed were unanimously adopted.

The President appointed as additional members of the Journal Committee:

Brig. Gen. J. T. Priestley, Iowa.

Maj. T. C. Clark, Minnesota.

Lieut. Col. Joseph K. Weaver, Pennsylvania.

On motion of MAJOR GEO. HALLEY, Mo., the association adjourned until 2:30 P. M.

FOURTH SESSION, FRIDAY AFTERNOON, MAY 31, 1901.

The Association was called to order at 3 P. M. by the President.

The Committee on Journal reported through P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S., who acted in behalf of the chairman of the committee, that after having various propositions submitted the committee recommended that the publication of a journal at this time would be inexpedient.

LIEUT. COL. J. D. GRIFFITH, Mo., moved that the report be received and accepted.

LIEUT. COL. J. D. GRIFFITH, Mo.—At the meeting a year ago, if you will refer to our proceedings you will notice that I spoke of the fact of the completeness of the volume as it is today. It is now an integer of your library from the first down to the present. It should be continued so, and as such it should be published at a nominal price,—I do not know what, say 75 cents, \$1.00 or \$1.50, whatever it costs to bind

it. But I do not like this idea of making either a monthly or a bi-monthly journal; a copy is liable to be lost and then what are you going to do? Now there are many things to be considered. We need a permanent secretary. We need a monthly journal. We need the proceedings in volume form. I do not know that there is a man within the sound of my voice that would not want one for his library, even though he does have every magazine and journal that comes out. So when I spoke a year ago at New York I said the same thing I say now: Let us have a monthly journal, a bi-monthly journal, or whatever this committee may recommend, but let us have the journal in a volume as before.

MAJ. T. C. CLARK, Minn.—This committee had presented to it certain propositions from different parties in regard to publishing the journal, which is the last of the subject under consideration from the standpoint of practicability. To make a journal a success would necessitate having its editor not only competent for the position, but easy of access to the point of publication. For instance, it has been suggested that a good editor might be secured and a permanent secretary who lives in a small town in Pennsylvania, and a very flattering proposition came to us for publishing a journal within a very few miles of this city. In case such a secretary be selected, having the editor of the journal and the publisher separated a thousand miles more or less would make it difficult to publish a journal under such circumstances. If a good, competent editor could be selected near the point of publication, within easy access of the publishing house it would make the project much easier to carry out. This committee thought it best to present its views in these resolutions which could be adopted or rejected, as the Association sees fit. We realized the fact that some means of communication between the Association and its members is necessary at an earlier date than is now provided by the volume of transactions. A pamphlet issued immediately after the close of the session containing a list of the officers for the ensuing year, a list of committees and other matters of interest in the line of acquainting the

members with what has been done would be very desirable, and it would go very far towards awakening the interest of non-attending members. During the year pamphlets could be issued showing the applications for membership, etc., and keeping the members in touch with the Association, and such circulars could be sent to non-members and thus awaken in them an interest. It would save the secretary a vast amount of work and inconvenience, because it will furnish the information many members write to him to get. This committee when we came to consider this matter did not feel in the absence of the knowledge of a man, a practical man for such a position and so situated that he could look after the interests of a journal, as though they were authorized to advise such a course, and they have therefore presented the subject in such a way that the views of the members could be obtained. We thought a trial for a year of this form, which would be an innovation, would put us in position to see whether this would cover the ground, and whether we should not wish another year to have a journal, and we considered this plan a step in the right direction. It is better to go slowly and carefully in this matter in order that we may make no mistakes.

COL. R. H. REED, Wyo.—This is a subject of great importance to this Association, and while I am not here for the purpose of advocating or discouraging the publication of a journal, I think it is well to consider this matter in all its phases. No doubt there are a number of members here who were present at the meeting of the American Medical Association when the Journal was born at Cleveland in 1882. Our proceedings had been published for years in volume form, just as the proceedings of this Association are published now, and about the time of our next annual meeting the volume would come out and would go on our shelves and many of the members would never read it. The question of publishing a journal came up, and it was a hard fought battle, but it was carried in favor of a journal. The Journal for some time after it was issued was an expense to the Association, but it is not an expense to the Association to-day; it is a means of revenue.

However, we could not well apply the same thing to this Association because we do not have the members to draw from, hence I think the action of the committee as expressed in the report was wise. We came here to this meeting and found one or two papers on the program instead of ten or a dozen as we had reason to expect. There have been some volunteer papers to help us out. Some of us have come fifteen hundred miles for the purpose of attending this meeting and I feel that we ought to have more literary work on our program than we have at this meeting. A number of writers do not care to furnish papers because they know they will be hid away a year or more and then come out in a volume where no body sees them. By that I mean the general practitioner who is interested in this kind of work, and in order to get it before them promptly the only way to do is to do it by some journalistic method. The question is what method is the best. We write our papers and read them here. They will come out a year from now in the volume, and it may be that the editors of a few journals will review it, and then it goes on the shelf as dead matter except to a few of us. What is the best method to pursue by which to obtain the best talent to write papers? We have offered a prize during the past year for papers. Did we get any? Not one paper. And I believe the cause lies in the fact that our proceedings do not get before the profession in the way they should. I believe there is room for improvement in this direction, and I believe the sooner we get down to some method to get our papers before the reading profession the sooner we shall get good papers and more papers by the best talent. This may be a good plan for another year, but I believe we have to definitely come to an understanding with some journal that is competent to spread the work before the reading profession of the United States and get it out in that form, and then have our volume succeed that in the same size and form in which it is published today. That can easily be done. We can get the journal very easily if we give it to them as first class matter, original matter, and afterwards put it in the form of a volume to put on our shelves.

While I am ready to vote for the resolution offered by this committee, I think it is a questionable procedure as a permanent matter. I am willing to vote for it as a temporary expedient, but we must get the best talent obtainable and use the best means possible to get it promptly before the reading profession.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I think Col. Reed's suggestion is a very good one, but I only want to call attention to the fact that in the meantime, until we can get a journal or publication of our own, we can always give our papers to various journals in different parts of the country, and they will be only too proud to publish them as original matter, and they can afterwards be published in our proceedings. I read a paper before the Association last year and it was published in two journals, one of them here in St. Paul and another on the Pacific coast, and I was furnished reprints from both publications. Any member who has a paper before the Association can do the same thing, the journals will be only too glad to receive it. Until we get a journal of our own, any member who is desirous of having his paper published can have it done, and I know the editor of any journal will take great pleasure in receiving it.

LIEUT. COL. JOHN VAN R. HOFF, U.S.A.—I am impressed with the idea that the matter under discussion is of the utmost importance to this association. I let my mind run back to the meeting of the Association held in Washington in 1894 where this very matter was under discussion, and where, after very careful consideration having been given to it by the committee appointed for that purpose, it was decided that then the time was not ripe and we would proceed as we had theretofore. Eight years have passed, and during those eight years there has occurred a war, and in that war there must have been no less than two thousand physicians engaged as medical officers. How many of those physicians are members of the Association of Military Surgeons? And why are they not members of the Association of Military Surgeons? How many of them if they were members could come here to these meetings?

We must have some means of addressing a very important constituency that properly belongs to us and with which we do not come in contact at all. We have five, six or seven hundred officers in the Philippines today, and I do not believe seven of them are members of this Association. We had hundreds of medical officers in the South during the Spanish war, in Cuba and Porto Rico. How much of the experience they have gained have we got in our Association today? All the papers we have got from such experience we could count on the fingers of one hand. There must be some radical change or this Association will cease to exist. We must have some way of addressing these people. What is the way? Through the instrumentality of your already established journals that will reach these people? Now I feel, and perhaps I am wrong, there is one remedy I have to suggest for a condition which seems to me to need a remedy. I believe the time has come, and the Association is today in position, as far as its finances are concerned, to start its own journal. If we wish to preserve the annual proceedings in volume form it is merely a question of sending out our journals to the book-binder and putting them on our shelves. Of course the United States is full of periodicals which would be pleased to publish our papers. Only a few days before I left Washington I had a letter from Gen. Rodenbough who asked me to see the writers of papers at this meeting and induce them to send the papers to him that they might be published in his journal (*Journal of the Military Service Institution of the United States*). If we do that we approximately get closer to our people who are now in the service than through any other existing instrumentality. That is not the point. We want these men to belong to us. We want this Association to be the connecting link between professional and civil life, between professional and military life. We want these men who have been both military officers and members of the profession in private practice to give their experience to people in civil practice so that they may know it requires more than a good general practitioner to become a good medical officer. The only way

we can do this is to get the people interested in this organization to use their influence in favor of this institution. I am in favor of a journal. If there is any other remedy, all right. The plan suggested by Major Clark is all right. At the time we held our convention at Columbus there were quite a number of notices to members, constitution, lists of members, etc., issued. That is what I understand Major Clark suggests. That was very well, but it did not get at the heart of the thing. The heart of the thing is to get hold of these men. We are an institution of three or four hundred members. We have a delinquent list that is appalling. We are going to lose the delinquent list. Instead of losing members, we want to gain members. Instead of a little list of three or four hundred we want three or four thousand members. We must do something to effect a change in this direction or we must soon go out of existence. (Applause.)

MAJ. T. C. CLARK, Minn.—I must ask the President to be permitted to speak again if there is no objection. I do not think any member of the committee or any member of the Association denies Colonel Hoff's assertions. That is a point that is admitted by all. The point of view the committee takes is from a business standpoint. Until this Association has some permanency of organization, until it has some central point where its records can be kept, until it has an organization which shall be able to perpetuate what has been done here and carry it through to the next meeting, and which can only be done through the election of a permanent secretary and the appointment of one committee which shall have charge of the work that has been done, we cannot hope to successfully publish a journal. You may have had great interest, you may have had a large and enthusiastic meeting a year ago today, and a year from now we may be dead, and we may not have a program as we did not have at this meeting. You may have \$5000 in the treasury today, and in a year or two you may be \$1000 in debt if you publish a journal. As soon as we get a permanent organization which can be perpetuated it will be safe to advocate the establishment of a journal.

The committee took the view that the first step necessary should be the election of a permanent secretary, a man with full knowledge of what is being done in this Association, who knows all the members, who knows how to select the working members to suggest to the president that he may select his committees. When you have a business organization to do business in a business way and you establish a journal it may be a success. The committee viewed this matter from the business man's standpoint, and it is for the best interests of the Association that until we get on a sound business basis it is not wise to establish a journal. When you establish a permanent secretary that is the first step. Then appoint a Literary Committee who will come to these meetings and make their report. It has been years since a committee came up here and made a complete report. We have got to get on a business basis first and then we can publish a journal.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—Then I think we had better get there quick.

COL. R. H. REED, Wyo.—I just want to say one word if there is no objection. I am in favor of a permanent secretary, but I want to say right here that the best secretary on earth cannot supply the talent we need in the Association. He cannot edit a journal unless he has the material to edit it with. That is the very point we are getting at, to present a plan for this Association to work under, to bring in something that editors can edit, and the sooner we can get at it the better.

LIEUT. COL. J. D. GRIFFITH, Mo.—What the committee suggests amounts to the same thing as a journal; it leads up to that.

A vote being taken on the motion offered by Col. Griffith, the report of the Committee on Journal was received and accepted.

Under the literary program the first paper read was by SURG. GEORGE TULLY VAUGHAN, U. S. M. H. S., on the subject of "Three Noteworthy Cases of Brain Injury."

The paper was discussed by Lieut. Col. Griffith, Col. Grant, Maj. Halley and Col. Reed.

On motion of P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S., the paper was received and referred to the Publication Committee.

DR. CHRISTIAN FENGER, of Chicago, formerly Assistant Surgeon in the Danish Army, was then introduced by the President and, upon invitation, made some interesting remarks upon "Secondary Hemorrhages."

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the address of Dr. Fenger was received and referred to the Committee on Publication.

LIEUT. COL. JOHN VAN R. HOFF spoke briefly on the subject of the "Regimental Field Equipment of the Medical Department of the Regular Army, Model of 1901," which he demonstrated to the Association.

On motion of COL. R. H. REED, Wyo., the discussion of Col. Hoff's remarks was postponed until the following session.

The Secretary, LIEUT. COL. CHAS. ADAMS, then announced the names of the members of the Nominating Committee as follows:

NOMINATING COMMITTEE.

Maj. Richard, U.S.A.
Maj. Root, N.G. Colo.,
Maj. Watson, N.G.Conn.,
Maj. Wesley, I.N.G.,
Maj. Wright, Ia.N.G.,
P. A. Surg. Wurtenbaker, U.S.M.H.S.,
Gen. Blood, M.V.M.,
Col. Fitz Gerald, N.G., Minn.,
Maj. Halley, N.G.Mo.,
Col. Evans, N.G.Neb.,
Gen. Cook, N.G.N.H., Chairman,
Col. Myers, N.G.N.J.,
Maj. Briggs, N.G.N.Y.,
Col. Archibald, N.D.N.G.,
Col. Weaver, N.G.Pa.,
Col. French, R.I.M.,
Maj. Evans, Wis.N.G.,
Col. Reed, N.G.Wyo.

LIEUT. COL. J. D. GRIFFITH, Mo., announced that he would make a motion for a change of the by-laws relating to the transactions.

On motion of LIEUT. COL. J. D. GRIFFITH the Association adjourned until Saturday morning, 10 o'clock.

FIFTH SESSION, SATURDAY MORNING, JUNE 1, 1901.

The Association was called to order by the President at 10:15 A. M.

In accordance with the resolutions consequent upon Maj. Seaman's paper, and which were adopted at a previous session, the President appointed the following committee to carry out the provisions of the resolutions relative to the Army Canteen:

Brig. Gen. Geo. Cook, New Hampshire.

Brig. Gen. J. T. Priestley, Iowa.

Col. Robert H. Reed, Wyoming.

Lieut. Col. J. D. Griffith, Missouri.

Major T. C. Clark, Minnesota.

Major Louis L. Seaman, New York.

Major Arthur L. Wright, Iowa.

Pursuant to a resolution passed at the previous session the discussion of Col. Hoff's remarks on the "Regimental Field Equipment of the Medical Department of the Regular Army" was then taken up.

At the request of the President, BRIG. GEN. GEO. COOK took the chair.

The literary program was resumed with a paper on "The Pennsylvania Brigade Hospital Tent," by LIEUT. H. A. ARNOLD, Asst. Surg. N. G. Pa.

The paper was briefly discussed.

On motion of LIEUT. COL. JOSEPH K. WEAVER, Pa., the paper was received and referred to the Publication Committee.

The second literary number on the program was an address by LIEUT. COL. J. D. GRIFFITH, Mo., on "Some Points in Military Surgical Practice."

The subject matter of the address was discussed by Col. Grant, Col. Reed and Lieut. Col. Marcy.

' During the discussion the Chairman introduced to the Association LIEUT. COL. HENRY O. MARCY, of Boston, who responded briefly.

On motion of COL. W. W. GRANT, Colo., the address of Lieut. Col. Griffith was referred to the Publication Committee.

The Secretary, LIEUT. COL. ADAMS, submitted the report of the Executive Committee. On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the report was received and accepted.

The Auditing Committee, through its chairman, BRIG. GEN. J. T. PRIESTLEY, Iowa, presented its final report.

On motion of LIEUT. COL. JOS. K. WEAVER, Pa., the report of the committee was adopted.

MAJ. T. C. CLARK, Minn.—There was a recommendation in the report which was not specific, and in order to give it force I will move that the Treasurer be authorized to employ such assistance as may be necessary so as not to interfere with his own business. Our experience with Treasurer Arnold has been such that we know we can trust him, and I will audit every bill that he brings in. I move you that the treasurer be empowered to employ any assistance he may find necessary in the conduct of his affairs.

The motion was numerously seconded and, being put to a vote, unanimously prevailed.

The report of the Nominating Committee was then submitted by its secretary, MAJOR CHARLES RICHARD, U. S. A.

LIEUT. COL. J. D. Griffith, Mo., moved that the report be adopted and that the gentlemen nominated be declared elected as officers of the Association for the ensuing year.

MAJOR T. C. CLARK, Minn.—The report of the committee contained two recommendations, one nominating the officers for the ensuing year and the other referring the time and place of meeting to the incoming Executive Committee. If the motion is intended to simply include the indorsement of the officers nominated I will vote for it, but if it also includes the time and place of meeting I would like to separate it.

COL. R. H. REED announced that with the consent of the

second he would divide the motion and move to adopt the recommendation relating to the election of officers.

LIEUT. COL. WEAVER, the second, consented to the division, and the motion being put to vote the officers nominated were declared unanimously elected as follows:

President.—Lieut. Col. JOHN VAN R. HOFF, U. S. A.

First Vice President.—Brig. Gen. ROBERT A. BLOOD, M. V. M.

Second Vice President.—Gen. WALTER WYMAN, U. S. M. H. S.

Secretary.—Major JAMES EVELYN PILCHER, U. S. A.

Treasurer.—Lieutenant HERBERT A. ARNOLD, N. G. Pa.

The President asked President-elect Lieut. Col. Hoff. to take the chair, and midst enthusiastic applause presented him to the Association with the following words:

Members of the Association of Military Surgeons:

Nothing that has happened to me during my connection with the Association of Military Surgeons has given me greater pleasure than to introduce to you the gentleman you have chosen as my successor, LIEUT. COL. JOHN VAN R. HOFF, of the United States Army. (Applause.)

The President-elect, LIEUT. COL. JOHN V. R. HOFF, responded as follows:

Comrades: A lady was passing through the wards of an overcrowded military hospital when she suddenly encountered two men sawing and hammering on some boards. She looked at them in some surprise and wonderingly asked:

"What are you doing there, my men?"

They looked up at her and one of them said:

"What are we doing? Why, we are making a coffin, that's what we are doing."

"A coffin?" she asked. "For whom are you making a coffin?"

"For that fellow over there in that bed. Don't you see him?"

The lady looked in the direction indicated and saw a man apparently in good condition and watching the operation with great interest.

"Why, that man is not dead, and indeed he does not look

as if he were going to die. Can't you postpone this work?" she asked.

"No," the men said, "we can't postpone it. The doctor told us to make the coffin and he knows what he gave him." (Great laughter.)

Gentlemen, you know what you have given me. You have given me a position of the greatest honor, a position that I have had an ambition when my turn came some time to fill, but a position which I conceive to be fraught with the greatest responsibility. These responsibilities you must help me to meet. The president of this Association is not the Association; every member has his work to do; every member should be willing to do that work, and you may be sure, gentlemen, that so long as I have the honor of presiding over the Association of Military Surgeons you will not lack for work. (Applause.)

The Assistant Secretary, LIEUT. S. C. STANTON, Ill., presented the following resolutions:

Resolved, That the Association extend to its retiring President, Brig. Gen. Alex. J. Stone, its appreciation of the able manner in which he has performed his duties.

Resolved, That the thanks of this Association be extended to the medical profession and citizens of St. Paul and especially to His Excellency Governor S. R. Van Sant of Minnesota for the courtesies shown the Association.

Resolved, That the thanks of this Association be extended to the management of the Hotel Ryan for head-quarters furnished during this meeting.

Resolved, That the thanks of this Association be extended to the officers and ladies at Fort Snelling for entertainment provided for the Association.

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the resolutions were unanimously adopted.

LIEUT. COL. J. D. GRIFFITH, Mo.—I want to offer an amendment to your By-Laws which will interest you exceedingly, and that is to amend Sec. 3, Art. VI, to read as follows:

"The Chairman of the Literary Committee shall be responsible for the program for the ensuing meeting."

I wish to make the chairman responsible for the literary program. Let us have it fixed so this announcement will be made within ninety days after the adjournment of the meeting.

COL. W. W. GRANT, Colo.—Is it not assumed that the chairman is responsible for the committee?

LIEUT. COL. J. D. GRIFFITH, Mo.—I beg your pardon, yes, it is always understood, but let us have it fixed.

COL. R. H. REED, Wyo.—I rise for information. I think according to the by-law it is the duty of the committee to arrange for a program, and as I understand Col. Griffith's amendment it provides that the chairman of the committee alone becomes responsible. I also understand it is the duty of the President of this Association as well as the Secretary to solicit papers and material for the meetings of this Association. On the other hand it is the duty of the Association to lay out business for this Association. It does not debar the President or the Secretary of the Association from soliciting members to take part on the program.

LIEUT. COL. J. D. GRIFFITH, Mo.—The President is *ex-officio* member of every committee he appoints.

BRIG. GEN. F. W. BYERS, Wis.—What would you gain by passing a resolution compelling somebody to do what he does not want to do? Can we make rules compelling members to do certain work, or should they have interest enough in the work to do it without compulsion? What is the use of trying to compel a man to do something that he probably does not want to do. I am opposed to such a resolution.

MAJ. T. C. CLARK, Minn.—I wish to say for the information of some gentlemen who have been speaking here that we had an illustration of this matter at this very meeting. A chairman of a committee wrote for information to know whether he was responsible for a report from his committee. That being the committee in charge of the program for this meeting you can very readily see the position in which we were placed. After the program was prepared and only five papers were provided the chairman asked whether he was responsible for the program.

THE PRESIDENT.—I think Col. Griffith fully understands that under the constitution this amendment can be voted upon only at the next annual meeting.

LIEUT. COL. J. D. GRIFFITH.—Then I will ask that this go over until the next annual meeting. It is an exceedingly important matter and it should be the duty of every member to try to remedy this matter. Not only that, Mr. President, but I will submit a further amendment to the by-laws, that:

The Literary Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

The President instructed the Secretary to make a record of the proposed amendments.

MAJOR A. H. BRIGGS, N. Y.—Those of you who attended the meetings of this Association in 1899 and 1900 will remember a very pleasant gentleman who represented the British army, Col. McWatters. I received a letter from him a short time ago telling me that he has been awaiting orders expecting to be sent to this meeting, but he concludes that the war in South Africa has probably pigeon-holed the order to send him here, but he wished me to extend his hearty greeting to this Association and wish them Godspeed in their work, and he regrets exceedingly the lack of orders that would bring him here.

THE PRESIDENT requested Maj. Briggs on behalf of the Association to thank Col. McWatters for his good wishes and to express its regret at his inability to be present at the meeting.

MAJ. T. C. CLARK, Minn.—The reason I wished to bring up separately the recommendations of the Nominating Committee was because we usually have some invitations presented to the Executive Committee and I wish to inquire whether any such invitations have been presented. The city that has to entertain this Association has men in it who are responsible for the work and they need all the backing they can get, and they want all the help we can give them by having the matter discussed here. I know the matter has been talked of from the beginning that Boston never had a meeting, that New England never had a meeting, but I deem it better that there be an invitation and that it be discussed with the gentleman who presents the invitation.

BRIG. GEN. R. A. BLOOD, Mass.—We should be very glad to have you come to Boston next time. (Applause.) We will do the best we can to give you a good time and show you everything we have there. We have good hotels, we have beautiful parks and a great many things that would interest you and we will do all we can to make it pleasant for you.

LIEUT. COL. J. D. GRIFFITH, Mo., moved that the Association hold its next meeting in Boston.

MAJ. A. H. BRIGGS, N. Y.—Rising to second that motion I wish to say, the reason the Nominating Committee left that matter as it was, was if possible to allow this Association to follow or immediately precede the American Medical Association. I think, however, it is impracticable for this small Association to follow after that great Association. They may go to Denver or even to San Francisco and it would be impossible for this Association to follow to those points. I think whenever it is convenient we should follow close up to the American Medical Association, but now comes the time for us ourselves to select the place of meeting in the hope that the American Medical will go to Boston next year. Therefore I heartily second the motion made by Col. Griffith that we accept the invitation to go to Boston for our next meeting.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I think, gentlemen, it would be very well to go a little slow in this matter of making a selection of a place of meeting. In the first place, last year the Association met in New York City. It has met in Philadelphia; it has met in Washington, Buffalo and other large eastern cities, and if you continue to go to the large cities, cities like Boston, New York, etc., we are very small potatoes in a great big row, whereas, if we go to the smaller cities we will there receive, as we have received here, a great deal of attention. [MAJ. CLARK: This is not a small city.] [Laughter.] What I want to call your attention to, is this: This Association has never met in the south except in Kansas City once. There is a large number of officers in the south who could be brought into the Association if the Association would come anywhere near their territory. I un-

derstand the president of the Association wrote to the various governors asking that they make details to this meeting. I know in Louisiana, where I am now stationed, a number of officers were detailed, and yet they were unable to afford the expense of coming up here and going back again. I have heard that it is possible that the American Medical Association will go south next year. It seems to me that if we could have a meeting place somewhere in the central south, like Memphis, Atlanta or New Orleans, it would be very much better for the Association. We would gather a large number of members in. We would get many in the south and west that would not take the long trip up to Boston. I think it was for that reason it was recommended in the committee that the whole matter be referred to the Executive Committee and allow them to determine the place of meeting later on. I think that would be a wise thing to do in the end, as the Executive Committee can determine that matter better than we can today.

COL. W. W. GRANT, Colo.—It gives me pleasure to second the suggestion of my friend on the right. I think six months from today the Executive Committee can determine the place of meeting better than we can today. I believe it better to adopt the recommendation of the Nominating Committee and leave the matter with the Executive Committee. They have communication with civil and military life and they will know just what is best to do. So far as the American Medical Association is concerned, that we ought to immediately precede or follow them, I doubt whether that is an opportune time to meet. That has been practically settled because of its encroachment upon Memorial Day. I would therefore move that the report of the Nominating Committee be adopted as a substitute to the motion providing for a meeting in Boston.

The motion was numerously seconded.

MAJ. T. C. CLARK, Minn.—I have no objection to the report of the Nominating Committee or to that theory, but I am a practical man, and if we receive an invitation from a certain city it means that there are some men back of it who will look

after the Association when it gets there. When men come here year after year from states where they can get no medical men into the Association and this committee sees fit to pick out some city in some section of the country that is nice, and then we go to that city and find no man who is familiar with the work of this Association it means that there is going to be a pretty sad time for somebody in that town. On the other hand, an invitation coming from some city is generally backed up by public sentiment in that city and enables them to provide for a successful meeting. Of course, there would be no difficulty to pick out a desirable section to go to, but it is my experience that you have got to have the public sentiment of the city or the medical department of the state back of the city that entertains the Association.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—If that is all there is lacking I will promise him invitations from a half dozen cities south of the Mason and Dixon line.

A vote being taken on the substitute motion of Col. Grant, the recommendation of the Nominating Committee placing the selection of a place of meeting in the hands of the Executive Committee, was adopted.

There being no further business to come before the Association the President declared the tenth annual meeting of the Association of Military Surgeons of the United States adjourned *sine die*.

CHARLES ADAMS.
Secretary.

Reports of Officers and Committees

REPORT OF THE SECRETARY.

THE Secretary has the honor to report that since the meeting of the Association in New York in 1900 we have suffered loss of membership, by death ten (10) and by resignation nine (9). Many names have been dropped from the rolls for non-payment of dues. Although blank applications for membership have been extensively circulated in the various services only seven applications have been made.

In exchange for the Transactions of the Association, the British Medical Journal, a List of the Medical Officers of the Swedish Army, and the Transactions of the Medical Societies of Rhode Island and Texas have been received and are now in the office of the Secretary.

Respectfully submitted,

CHARLES ADAMS,

St. PAUL, May 30, 1901.

Secretary.

REPORT OF THE TREASURER.

THE Treasurer has the honor to submit the following report of an office happily relieved of the embarrassment of a condition of impecuniosity. My tribulations consequently were few, and may be briefly stated.

One of the difficulties incurred in the interim during which we had no meeting was the fact that the dues went on, and many members felt they were getting no benefit from their membership; the Treasurer has received numerous complaining letters, and the arrearages of dues amounted to considerable. During the past two years it has been the task of the treasurer to mollify the members three, four, or even five years in arrears. In carrying them on the books this long I will say I felt that I was not violating the spirit of the article providing for the dropping of delinquents, and as a reward for the retention of such members I received from a number \$20, from some \$15, and I felt that this meeting would also result in the payment of dues in similar amounts by such members.

I come to this meeting with six life members.

One member paid in advance.

162 members fully paid.

120 owing \$5 each.

20 owing \$10 each.

76 owing \$15 each.

66 carried on the books owing \$20 each.

25 carried on the books owing \$25 each.

In explanation of the fact that these have been carried I will say that it is partly owing to the changes that have taken place in consequence of the Spanish-American war. Likewise owing to the election of new Governors in the various States, and consequent changes in the medical departments of the different national guards. Some have become disinterested, and some, through pecuniary sacrifice during the Spanish war, have stated their inability to pay at the time, but have expressed a desire to remain on the books and promised payment in the future. Some of the promised payments are now materializing.

REPORT OF RECEIPTS AND EXPENDITURES

From May 29, 1900 to May 26, 1901.

RECEIPTS.

Cash on hand May 29, 1900	-	-	-	-	-	-	-	-	\$3229.79
Received from sale of Proceedings	-	-	-	-	-	-	-	-	11.50
“ “ Application fees	-	-	-	-	-	-	-	-	140.00
“ “ Dues	-	-	-	-	-	-	-	-	1565.10
“ “ Sale of Insignia	-	-	-	-	-	-	-	-	236.00
Interest on Deposits	-	-	-	-	-	-	-	-	83.66
									<hr/> \$5266.05

DISBURSEMENTS.

For Postage and Internal Revenue Stamps	-	-	-	-	-	-	-	\$ 25.20	
“ Printing	-	-	-	-	-	-	-	13.75	
“ Insignia	-	-	-	-	-	-	-	228.60	
“ Postage and Expressage, Distributing Proceedings	-	-	-	-	-	-	-	90.20	
“ Storage of Proceedings	-	-	-	-	-	-	-	86.25	
“ Application fees retained by the Secretary	-	-	-	-	-	-	-	105.00	
“ Expenses of Annual Dinner	-	-	-	-	-	-	-	52.00	
“ “ New York Meeting	-	-	-	-	-	-	-	7.16	
“ “ Literary Committee N. Y. Meeting	-	-	-	-	-	-	-	56.35	
“ Reporting New York Meeting	-	-	-	-	-	-	-	100.00	
“ Volume VIII Proceedings	-	-	-	-	-	-	-	774.70	
“ Freight Vol. VIII Columbus to Ardmore	-	-	-	-	-	-	-	12.49	
“ Treasurer's Bond Renewed for one year	-	-	-	-	-	-	-	15.00	
“ Incidental Expenses	-	-	-	-	-	-	-	36.90	\$1603.60
								<hr/>	<hr/>
Balance in Treasurer's hands	-	-	-	-	-	-	-		\$3662.45

There is nothing further to add except the suggestion that it might be wise to limit the number of transactions issued, owing to the bulk of material of that character now in the hands of the Treasurer. I have several tons of matter, but all of it valuable. I have supplied medical libraries, and libraries of the largest institutions throughout the country as far as they have come to my knowledge. I have also forwarded copies of the transactions to all of the more prominent medical journals of the country, and a few requests have come from foreign sources which have been complied with. We still have a great many copies of the transactions of each year to spare, with the exception of one year. The price has been

fixed very low. I do not know that it is necessary to change this rate, but if it is the pleasure of the Association to dispose of these copies, the Treasurer will comply with their wishes.

The expense of printing and distributing Volume IX of the Proceedings, is the only unpaid obligation of the Association, this Volume being still in the hands of the printer.

Respectfully submitted,

H. A. ARNOLD,

Treasurer,

REPORT OF THE EXECUTIVE COMMITTEE.

THE Executive Committee presents to the Association an amendment to the Constitution as follows:

To amend Sect. 3, Art. 2, referring to Associate Members, by inserting after the words "Ex-Medical Officers of the United States Volunteer Service" the words, "and Ex-Medical Officers of the Confederate Army and Navy, whose service was honorably terminated."

This amendment was referred to the Executive Committee by a unanimous vote of the Association on June 20, 1900.

The Committee reports¹ the election of the following:

May 30, 1901.

ACTIVE MEMBERS.

Anderson, Winslow, Col. and Surg. Gen., N.G.Cal.,
Bloodgood, Delavan, Med. Dir. (Capt. Ret.) U.S.N.,
Drake, Clarence Eugene, Capt. and Asst. Surg., O.N.G.,
Evans, Carroll D., Col. and Surg. Gen., N.N.G.,
Fuller, D. R., Capt. and Asst. Surg., N.G.P.,
McCormick, Louis P., Capt. and Asst. Surg., N.G.P.,
Pierce, Norval H., P. A. Surg. Lt., I.N.M.
Root, Matt R., Maj. and Surg., N.G.Col.,
Stieren, Edward, 1st Lt. and Asst. Surg., N.G.P.

¹ These names were reported upon the three days of the meeting as noted and are grouped together for convenience of reference.

ASSOCIATE MEMBER.

Fox, Charles James, Brig. Gen., Surg. Gen. (Ret.), C.N.G.:

and recommends for election as an

HONORARY MEMBER

Fenger, Dr Christian, of Chicago, late Lt and Asst. Surg., Danish Army.

May 31st, 1901.

ACTIVE MEMBERS.

Bentley, Edwin, Maj. and Surg. (Ret.) U.S.A.,
 Davis, John S., Lt. and Asst. Surg., I.N.G.,
 Dorsey, John H., Lt. and Asst. Surg., N.G.Minn.,
 Fairchild, David Sturges, Jr., Maj. and Surg., N.G.Iowa.
 Jacoby, William, Maj. and Surg., N.G.Minn.,
 Rowe, William H., Lt. and Asst. Surg., N.G.Minn.,
 Sweet, Charles F., Maj. and Surg., R.I.M.,

ACTIVE MEMBERS.

Ford, Francis C., Lt. Col. and Med. Dir., Tex. V.G.,
 King, Chas. F., Capt. and Asst. Surg., N.G.Wis.

ASSOCIATE MEMBER.

Marcy, Henry O., Lt. Col. and Med. Dir., U.S.V. (Civil War).

The Committee places on record for adoption at the next ensuing annual meeting the following substitutes for the sections of the Constitution and By-Laws, bearing the corresponding numbers:

CONSTITUTION.

ARTICLE II.

MEMBERS.

SEC. 1. There shall be Active, Life, Associate, Corresponding and Honorary Members.

SEC. 2. Active and Life members only are eligible to office or entitled to vote.

ACTIVE MEMBERS.

SEC. 3. Active membership is limited to commissioned medical officers of

1. The United States Army;
2. The United States Navy;
3. The United States Marine Hospital Service;
4. The United States Volunteers;
5. The National Guard and other state troops; and
6. Contract or acting assistant surgeons of the United States Army, Navy and Marine Hospital Service.

Active members may retain their membership, should they be honorably discharged from the service in which they have been commissioned.

LIFE MEMBERS.

SEC. 4. Life membership and exemption from the payment of annual dues is conferred upon

1. The Prize Essayists of the Association, and
2. Any active member upon the payment of fifty dollars at one time.

ASSOCIATE MEMBERS.

SEC. 5. Associate membership is open to ex-medical officers and other officers of the aforementioned services, ex-medical officers of the Confederate Army and Navy, whose service was honorably terminated, and other persons interested in the promotion of military surgery.

CORRESPONDING MEMBERS.

SEC. 6. Corresponding membership is open to military surgeons, not resident in the United States, but prominent in military medicine, surgery, and hygiene.

HONORARY MEMBERS.

SEC. 7. The President of the United States, the Secretaries of War and the Navy, the Commanding General of the Army, and the Admiral of the Navy for the time being, are honorary members. Other persons, who have rendered distinguished service to the Association, or who have otherwise attained distinction deserving of recognition by the Association, are eligible to honorary membership.

BY-LAWS.

ARTICLE III.

MEETINGS.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-President, and Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

DUES AND DELINQUENTS.

The dues to be paid by Active and Associate members shall be three dollars (\$3.00) with the application for membership, and three dollars (\$3.00) per annum thereafter, due on January 1 of each year.

Delinquents in the payment of dues will not be entitled to the Proceedings or other publications of the Association. Delinquency for two years shall terminate membership, after due notice by the Treasurer.

No one formerly a member of the Association, who shall have allowed his membership to lapse by non-payment of dues, shall be reinstated before paying all arrears.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

DUTIES OF OFFICERS.

THE SECRETARY.

SEC. 3. The Secretary shall keep the records and archives of the Association; receive all applications for membership and refer them to the executive committee; notify the Treasurer of the election of active and associate members; issue certificates of membership to active, associate, corresponding and honorary members on election, and to life members when advised by the Treasurer that the necessary fee has been paid; and shall hold office until his tenure is terminated by resignation or death, or by the election of his successor after due and timely notice.

He shall be a member and *ex officio* chairman of the Publication Committee.

He shall appoint an Assistant Secretary each year, and shall present an annual report.

THE TREASURER.

SEC. 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved. He shall have charge of all publications, and distribute the same to those who are entitled to them.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties, the Association to bear the cost of this insurance.

ARTICLE VI.

DUTIES OF COMMITTEES.

THE PUBLICATION COMMITTEE.

SEC. 2. The Publication Committee shall have charge of the publications of the Association.

It shall determine what portions of the proceedings are of sufficient general interest to be printed, and decide upon the advisability of publishing the several papers, presented at the annual meetings, and such other matter as may be of value to the Association.

It shall prepare for publication, contract for printing, and see through the press all the publications of the Association; but all contracts for printing must first have the approval of the President and the Treasurer.

THE LITERARY COMMITTEE.

SEC. 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

The Chairman shall be responsible for the program for the ensuing meeting.

The Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

CHARLES ADAMS,
Secretary.

REPORT OF THE PUBLICATION COMMITTEE.

THE Publication Committee has the honor to report that the volume of Proceedings of the Ninth Annual Meeting is completed and is in the hands of the Treasurer for distribution. The book is proportionately lighter than any previous volume and is printed on an unglazed book paper which presents the advantages of lightness in weight and a non-reflecting surface which more than compensate for the slight increase in bulk. The delay in issue of the book has been unavoidable and is due chiefly to the impossibility of securing certain papers necessary to complete the volume.

The Committee suggests, in order to facilitate its work, that a by-law be adopted which shall provide that all papers in order to be incorporated in the Proceedings shall be in the

hands of the Committee within thirty days after the adjournment of each meeting.

Conformance with this by-law would make it possible for the Committee to issue the volume of Proceedings prior to October first following.

CHARLES ADAMS,

G. W. ADAIR.

S. C. STANTON.

ST. PAUL, MINN., May 30, 1901.

REPORT OF THE NOMINATING COMMITTEE.

THE Committee met at 12.15 A. M., and organized by the election of Gen. Cook of New Hampshire as Chairman, and Major Chas. Richard, U. S. Army as Secretary. An adjournment was then taken until 4.30 P. M.

The Committee met at 4.30 P. M. and after discussion regarding the time and place for the next annual meeting passed the following resolution, viz:

Resolved, That the Committee recommends that the selection of the time and place for the next annual meeting of the Association be referred to the Executive Committee of the Association and that Memorial Day be avoided as one of the days of the meeting, if possible.

The Committee then proceeded to the election of nominees for officers of the Association for the succeeding year, and recommends the following:

For President, Major JOHN VAN R. HOFF, U. S. Army.

For First Vice President, Brig. Gen. ROBERT A. BLOOD, M. V. M.

For Second Vice President, Gen. WALTER WYMAN, U. S. M. H. S.

For Secretary, Major JAMES EVELYN PILCHER, U. S. Army, Ret.

For Treasurer, Lieut. HERBERT A. ARNOLD, N. G. Pa.

The following resolution was then unanimously carried:

Resolved, That the thanks of the Association be extended to Lieut. Col. Chas. Adams, of Illinois, for the efficient manner in which he has performed the duties of Secretary of the Association for the past two years.

There being no further business before it, the Committee then adjourned.

GEORGE COOK,

Brig. Gen. N. G. N. H., *Chairman*.

CHAS. RICHARD,

Major and Surgeon. U. S. A., *Secretary*.

REPORT OF THE COMMITTEE ON TRANSPORTATION.

I HAVE to make, simply an announcement that the meeting of the American Medical Association preceding this had secured rates, and it was with but little difficulty that we secured the same rates as conceded to them. Our rate this year is without the certificate plan, which is a nuisance and an annoyance, and I hope this Association in the future will be able to secure the same rates. The great embarrassment is to get certificates. The railroads have always required of us one hundred certificates, but never in the history of the Association did we have one hundred certificates, and it was only through the kindness of the transportation associations that we were conceded the rate. It places the committee in a very embarrassing position to have to go down on its knees and beg of them to give us the rates, but this year we got a round trip rate of one fare plus \$2.00 in the Western Central Traffic Association, and in the Trunk Line Association, which takes in all the lines east of Buffalo and Pittsburgh, it has been a rate of one and one-third. I took the trouble to write to all the members whose addresses I knew informing them of a way to get around that. I see there are a good many here and I am glad I went to the trouble. They could buy tickets to Buffalo, Pan-American Exposition tickets. for a little more than half fare, deposit those tickets at Buffalo and get their tickets from Buffalo to this point for half fare plus \$2.00. As I said there is little to report except these facts, but I am satisfied that we have had a better and cheaper rate than ever before.

A. H. BRIGGS.

REPORT OF THE AUDITING COMMITTEE.

THE members of the Auditing Committee have examined the books of the Treasurer and find them absolutely correct, and think the gentleman has done very good service, indeed, and it is the opinion of the committee that he should have some help in keeping the books as the work is very laborious. It has got to be a great deal of work and there should be some recompense.

The Auditing Committee also recommends that the number of volumes issued be reduced from 750 to 500 copies. There have been a large number of volumes left over every year and we are paying \$90 a year storage on old volumes, an expense that certainly ought to be done away with. We do not need more than 500 volumes.

JAMES TAGGART PRIESTLEY,
THOMAS C. CLARK,
ROBERT HARVEY REED.

REPORT OF THE COMMITTEE ON JOURNAL.

THE Committee on Journal, after considering the various propositions submitted, reports that it believes the publication of a Journal inexpedient at the present time, further, that many of the points suggested as reasons for the publication of a Journal can be covered by the election of a permanent secretary, who shall be authorized to issue in pamphlet form within thirty days after the meeting of the Association the minutes of the meeting, lists of officers and committees for the ensuing year, and brief notes of interest regarding the meeting, and that circulars of information be issued by the Secretary whenever in his judgment such issue may be advisable.

C. P. WERTENBAKER,
T. C. CLARK,
JAMES TAGGART PRIESTLEY,
JOSEPH K. WEAVER,
CHARLES ADAMS.

REPORT OF THE NECROLOGY COMMITTEE.

DURING the past year I have had reported to me ten deaths which have occurred in the membership of the Association:

Louis W. Read, Col. and Surg. General, of Pennsylvania,
Ex-President.

Truman W. Miller, Major and Surgeon, I. N. G.

Michael R. Piggott, P. A. Surgeon (Lt. j. g.) U. S. N.

William H. Egle, Major and Surgeon, N. G. Pa.

Alexander S. Porter, Captain and Asst. Surgeon, U. S. A.

John H. Grove, Ex-Brev. Lt. Col. and Surgeon, U. S. V.

Andrew C. Bergen, Lt. Col. and Surgeon, N. G. Iowa.

Frank T. Lincoln, Major and Medical Inspector, Ga. V.

Franklin Gauntt, Lt. Col., and Surgeon, N. G. N. J.

Selden J. Mudge, 1st Lt. and Assistant Surgeon, N. G. N. Y.

I am obliged to say that notice of these deaths was not given me quite early enough to have a full obituary list prepared. Maj. Weaver has prepared a notice upon the death of Col. Read, and Maj. Halberstadt has prepared the obituary of Maj. Egle. If it is the pleasure of the Association I will continue the work and see that obituary notices of all these deceased members are prepared for publication in the next volume of transactions.

GEO. COOK,
Chairman.

Colonel Louis W. Read.

President, 1895-1896.

Born July 5, 1828—Died October 31, 1900.

COL. READ was the eldest son of Thomas and Sarah (Corson) Read, and was born at Plymouth, Montgomery county, Pennsylvania, July 5, 1828. His parents were natives of Delaware county, as were his grandparents, William and Susan Read, and his mother was a daughter of Joseph Corson, and a sister to the late Drs. Hiram and William Corson.

He received his education in the early common schools and Treemount academy. Leaving school he read medicine with his maternal uncle, Dr. William Corson, and then entered the medical department of the University of Pennsylvania, from which he was graduated in the class of 1849. After graduating he devoted himself to his profession, and while thus engaged came the Crimean war cloud in southern continental Europe, which opened before him an extended and highly valuable field for scientific observation and practical work. He offered his services to the Russian government, and being accepted, he served as a surgeon throughout the Crimean war, and was at Sebastapol during its long and terrible siege by the allied forces. During this service under the Czar, he effected important improvements in the manner of treating gun-shot wounds, which were afterwards generally adopted, both in Europe and the United States.

Leaving Russia at the close of the war, he spent six months in the hospitals of Paris where he had a new and valuable field for the study of serious wounds and complicated diseases.

Returning home in the autumn of 1857, he came to Norristown, where he has been successfully engaged ever since in the practice of medicine and surgery. While ranking with the foremost of his profession as a general practitioner it was as a military surgeon he won his highest position and widest fame.

When the late Civil War commenced, Dr. Read was enjoying a fine practice, but he tendered his services to the government. In May 1861, he was appointed surgeon of the



COLONEL LOUIS W. READ.

First Pennsylvania Reserves, and in June was promoted to surgeon of United States Volunteers, with the rank of Major, and assigned to the Thirteenth Pennsylvania infantry. He

resigned this position in 1863, to accept the medical directorship of the Pennsylvania Reserve Corps, and in November, 1864, was placed in charge of McKim United States hospital at Baltimore, and remained there until March, 1866, when the hospital was closed and he was mustered out of the Federal service with the rank of Brevet Lieutenant Colonel of United States Volunteers, which had been bestowed on January 12.

From the time of his return to private life until six weeks prior to his death, Dr. Read continued in active practice. He was Surgeon General of the National Guard of Pennsylvania from May 15, 1874, when he was appointed by Governor Hartmanft, with the rank of Brigadier General, continuing in the same office when, upon the later organization, its rank was made that of Colonel, until shortly after the inauguration of Governor Stone in 1899. While at the head of the Medical Department of the Pennsylvania National Guard, Surgeon General Read secured many important changes, looking to the more advanced treatment of the sick and wounded, and brought the Hospital Corps up to a high standard of efficiency.

Dr. Read was long regarded the leading practitioner in his community, and his fame as a surgeon was as widespread as his name for good fellowship. An incident in his life that brought him into prominence was his removal, in December, 1863, of the bullet that disabled General Hancock at Gettysburg. The General had lain many weeks on a bed of suffering at his Norristown home, and his life was despaired of. The General himself had given up all hope of ever being able to rejoin his comrades, until on a December day in 1863, when he was visited by Dr. Read, who had come home on a day's leave. At the request of the General, with whom he had long been intimate, Dr. Read probed the wound and removed the bullet, and was accorded the distinction of having saved the life of the hero of Gettysburg, a fact which added greatly to his already high reputation.

Dr. Read was a member of the Military Order of the Loyal Legion, the Union League, the Association of Sons of the

Revolution, the United Service Club and the Historical Society of Pennsylvania.

He was a charter member of the Association of Military Surgeons of the United States and an influential factor in its formative days. He was elected second vice-president in 1893, first vice-president in 1894, and president in 1895, presiding with great dignity and acceptability at the magnificent meeting worked out under his direction at Philadelphia in 1896.

He pursued his profession until the last, with great activity and industry, and was held in high esteem by his professional brethren. He was of genial nature, social disposition and kind heart, which endeared him to all who were brought in contact with him. He died in the bosom of his family,—a quiet painless death,—and was buried, mourned by the whole community in which he had so long resided, and by them acknowledged a hero and a public benefactor.

Major Truman W. Miller.

Born March 2, 1840—Died May 31, 1900.

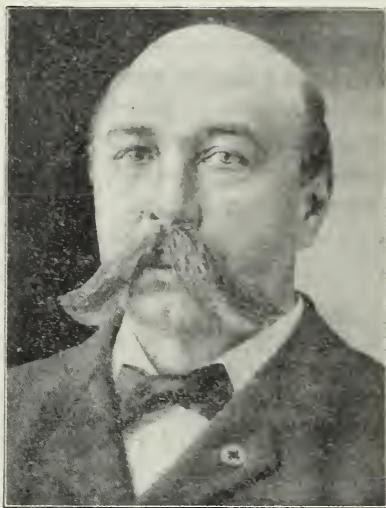
MAJOR MILLER was a charter member of the Association of Military Surgeons, led thereto by experience in three services. Having graduated at Hobart College and pursued his medical studies at the College of Physicians and Surgeons of New York, his patriotic spirit pressed him to service in the War of the Rebellion and in 1862, he became a Medical Cadet in the United States Army; and a year later, having received his doctorate from Geneva Medical College, was appointed Acting Assistant Surgeon. He served in the Army of the Potomac until after the Battle of the Wilderness when he took station at Chicago as attending surgeon and examiner of recruits, continuing his duties to the end of the War.

In 1873 he was appointed Assistant Surgeon in the United States Marine Hospital Service, becoming Surgeon

in 1877 and remaining in active service for the ensuing nine years.

The State troops formed another outlet for the soldierly spirit so conspicuous in his nature, and for five years he served most efficiently as Surgeon of the First Regiment of the Illinois National Guard.

His professional activities ran along many lines. He was prominent as a medical educator and at the time of his death

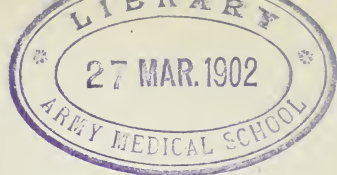


MAJOR TRUMAN W. MILLER.

was President and Professor of Surgery of the Chicago Policlinic. Many of the hospitals in the city sought his services and at the time of his death he was surgeon to the Maurice Porter Children's Hospital and consulting Surgeon to St. Joseph's, German, and Alexian Brothers' Hospitals. Numerous railway lines took advantage of his surgical skill, and a number of insurance companies regarded him as a court of last resort.

In addition to his relations with the Association of Military Surgeons, he was a member of the Grand Army of the Republic, and a member of many national and local medical societies, conspicuous among which were the American Academy of Railway Surgeons and the American Medical Association, being vice-president of the Board of Trustees of the latter, and at one time *ad interim* editor of the *Journal* of that body.

He was preeminently a man of action, endowed with a highly developed executive faculty and possessed of a remarkable power of discriminative judgement. Widely loved, he was widely mourned.

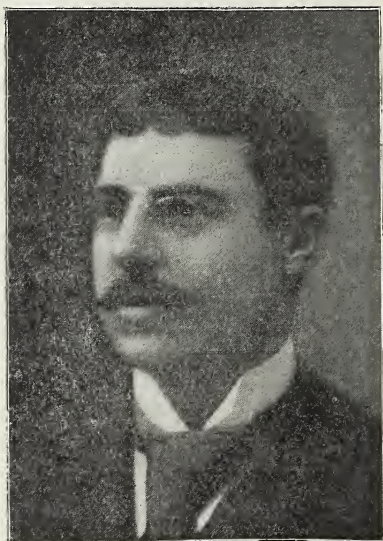


Passed Assistant Surgeon Michael Royston Pigott, U. S. N.¹.

Born January 27, 1866—Died January 30, 1901.

PASSED ASSISTANT Surgeon Michael R. Pigott, U. S. Navy, was born in Boston, Mass. After receiving his earlier education in the local schools and graduating from the English High School at Boston, he entered the Massachusetts Institute of Technology to pursue the course in electrical engineering. Receiving an appointment as Naval Cadet he left that institution during his first term to enter the Naval Academy at Annapolis, Md., in September 1883. After completing the regular course there, he graduated, but was unable to receive a commission owing to legislation at that time limiting the line of the Navy.

He at once took up the study of medicine at the University of Virginia, where he received his degree in 1890. Subsequent to his graduation he was occupied in various hospital and dispensary positions, including a period of service as interne at Bellevue Hospital. In March 1891, he passed the prescribed examination preliminary to entering the Medical Corps of the Navy, and on May 22nd was commissioned an Assistant Surgeon. During the next three years he was on duty in the Naval Hospitals at Chelsea and Mare Island, and made his first cruise of two years duration, on the Baltimore and the



MICHAEL R. PIGOTT, U. S. N.

¹Courtesy of the Surgeon General of the Navy.

cruiser Kearsarge; most of this tour of sea service being on the Pacific Station. Returning home in 1894, he passed his examination for promotion, and was commissioned a Passed Assistant Surgeon three years from his date of entry into the service. After a few months of duty on shore he joined the Olympia, then newly commissioned, and for the next three years remained on the Asiatic Station, returning to the United States early in 1898. Thereafter he was assigned to duty at the Naval Academy, making a short cruise as Medical Officer of the Chesapeake, the training ship for naval cadets, in the summer of 1900, and returning to the Academy in the fall. Throughout this tour of duty he was constantly and actively employed and he continued to be so engaged up to the very day of his death. There had been apparently no indication of organic heart trouble, and his death was therefore a sad surprise to his many friends within and without the service. It occurred during the night of January 30th, 1901, and was due to paralysis of the heart.

Modest and gentle in demeanor, Dr. Pigott never had a photograph taken of himself, from the time of his entrance to the Naval Academy, and the portrait herewith presented has been extracted from a family group taken while on leave at his home.

Captain Alexander Shaw Porter, U. S. A.

Born February 5, 1868—Died January 6, 1901.

THE University of Maryland at its Commencement, April 8, 1899, conferred the degree of M. D. upon Alexander Shaw Porter who was born soon after the Civil War at Lonaconing in that state. In 1893, he appeared before the army medical examining board and won a commission as 1st Lieutenant and Assistant Surgeon with rank from Oct. 26 of that year. His work at the Army Medical School, which followed was of a high order and brought him out, upon graduation in 1894, second in his class. He was then ordered to duty in the

Department of Dakota, but transferred, six months later to the Department of the Platte, where he served until failing health compelled his absence on sick leave for four months early in 1898. He was then stationed at San Diego, California, for a year, in the hope that the climate might alleviate his malady, but on examination for promotion in May 1899, he was found physically disqualified by reason of pulmonary tuberculosis contracted in the line of duty, and on June 8 was retired from active service with the rank of Captain. His affection continued steadily to progress until he succumbed, at



CAPTAIN ALEXANDER SHAW PORTER.

Fort Whipple, Arizona, January 6, 1901. During the period of his disability he never ceased to maintain his professional enthusiasm, and was always interested in the work of the Association of Military Surgeons of which he became a member while on sick leave in 1898.

Major William Henry Egle,

Born September 17, 1830—Died February 19, 1901.

MAJOR EGLE was attacked with grippe February 15, which rapidly developed into pneumonia to which he succumbed five days later. He is survived by a widow and two daughters. A son died in early manhood, on the thresh-

old of a most promising career as a physician, and scientist.

His ancestors settled in Pennsylvania prior to 1740. A great grand-father served as an officer in the French and Indian wars. His paternal grand-and great grandfathers served in the war of the revolution, and his maternal grandfather served in the war of 1812.

He was educated in the public schools, and the Harrisburg academy. In 1848 he was tendered the appointment of midshipman in the United States navy, which was declined. At the close of his school life, he spent three years in the of-



MAJOR WILLIAM HENRY EGLE.

office of the *Pennsylvania Telegraph*, and had charge of the state printing, which was done in that office. In 1853 he edited the *Literary Companion*, as well as the *Daily Times*. In 1857 he entered the Medical Department of the University of Pennsylvania, and was graduated in 1859. He practiced his profession in Harrisburg until 1862, when he went to Washington in response to a telegram from Adjutant General Russell of Pennsylvania, to assist in the care of the wounded, after the battles of Chantilly and second Bull Run.

In September 1862 he was commissioned assistant surgeon of the Ninety-sixth regiment, Pennsylvania volunteers, and arrived at his post on the eve of the battle of Antietam. In 1863 he was appointed surgeon of the Forty-seventh regiment, Pennsylvania volunteer militia. In 1864 President Lincoln appointed him surgeon of volunteers. He was ordered to

Camp Nelson, Kentucky, to examine colored volunteers. He was subsequently detailed under Colonel James S. Brisbin and Colonel James F. Wade in the famous attempt of General Burbridge to destroy the salt works in South-Western Virginia. Later he served in the Department of the James under General Butler, as surgeon of the One Hundred and Sixteenth United States Infantry. Subsequently he was assigned to the Twenty-fourth army corps, General Birney's division, as executive medical officer, and accompanied that division during the Petersburg and Appomatox campaigns. Upon his return he was ordered to Texas with General Jackson's division, as chief medical officer, and served then until December 1865, when he resigned and returned to Harrisburg, and resumed the practice of his profession.

Upon the organization of the National Guard of Pennsylvania in 1870, Dr. Egle was appointed surgeon in chief of the Fifth division with the rank of lieutenant colonel. With the reorganization of the guard he was appointed surgeon of the Eighth regiment, and served with that command until 1885, when he was appointed Brigade Surgeon and assigned to the Third Brigade. With the Guard he saw service in the "Sawdust War" of 1871, the railroad riots at Pittsburg in 1877, and at Homestead in 1892. On account of an injury to his knee, he was compelled to resign his commission in April, 1898.

From 1867 to 1871 he served on the board of Pension Examiners. For twenty years he was physician to the Dauphin County prison.

He was appointed state librarian by Governors Beaver, Pattison, and Hastings, and served in that capacity for twelve years. The present effectiveness of the state library is very largely due to Dr. Egle's management.

In 1865 during relaxation from professional work, he commenced his "History of Pennsylvania" published in 1876, and followed by his bi-centennial edition in 1883, of which 15,000 copies were sold. Among his other literary works, were the "Historical Register," in two volumes (1883-1884); "History

of the County of Dauphin" (1883); "History of the County of Lebanon" (1883), "Centennial of the County of Dauphin, and the City of Harrisburg" (1886); "Pennsylvania Genealogies, chiefly Scotch-Irish and German" (1886), reprint (1896); "Harrisburg on the Susquehanna" (1892); "Notes and queries, historical and genealogical and biographical, relating to the interior of Pennsylvania," first and second series, two volumes (1878-1882), reprint two volumes, (1894-1895), third series, two volumes, (1887-1891), reprint, (1895-1896), three volumes; fourth series, two volumes (1891-1895). He edited the second and the first twenty-six volumes of the third series of the "Pennsylvania Archives."

Dr. Egle also wrote two hundred biographical sketches of prominent Pennsylvanians, for Appleton's Encyclopedia of Biography, and also biographical sketches of the members of the constitutional convention of 1776, and of the delegates to the Pennsylvania convention to ratify the constitution of the United States.

Lafayette College conferred the honorary degree of A. M. in appreciation of his services in American history.

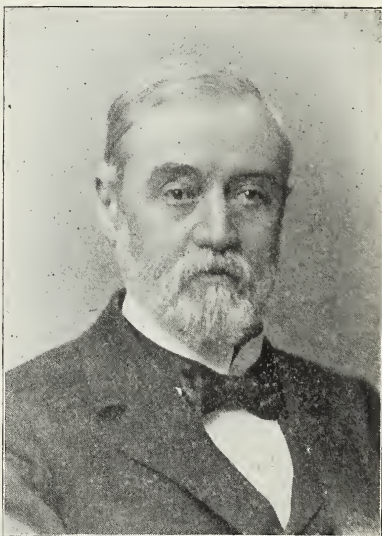
Dr. Egle was a corresponding member of many historical societies in the United States and Europe. He was one of the founders and first President of the Pennsylvania German society. He was a member of the Military order of the Loyal Legion, the Society of the Army of the Potomac, and of the Grand Army of the Republic, the Cincinnati, and the Societies of Colonial Wars, the Sons of the Revolution, the War of 1812, and of Foreign Wars of the United States; the Dauphin County Medical Society, the State Medical Society, the Harrisburg Academy of Medicine, and an active member of the Association of Military Surgeons of the United States from its foundation.

Bvt. Lieut. Col. John H. Grove, U. S. V.

Born January 13, 1825—Died April 6, 1901.

BORN in Maytown, Pennsylvania, John H. Grove, after receiving his preliminary education in the public schools of his native county, took a course at Barnet Academy, in Marietta. He then entered the Medical Department of the University of Pennsylvania, graduating in 1849. In later years he received the honorary degrees of A. M. from La Salle College, Philadelphia, and of LL. D. from Manhattan College, New York.

Soon after graduating he commenced the practice of his profession in Marietta, where he continued until the outbreak of the Civil War. In 1861 he received the appointment of Brigade Surgeon in the United States Volunteers, with the rank of Major. He was later breveted a Lieutenant Colonel and served until 1865.



LIEUT. COL. JOHN H. GROVE.

In 1867, Dr. Grove, commenced the practice of his profession in Philadelphia. During his long residence there he contributed articles freely to the medical journals. Immediately after the building of St. Agnes's Hospital he was chosen Medical Director, at the same time holding a similar position at St. Mary's Hospital, which position he retained for several years.

In 1899, Dr. Grove presented a handsome memorial chapel to the Presbyterian Church at Marietta, Pa., where he was buried.

He was a fellow of the College of Physicians, and since

1896 an associate member of the Association of Military Surgeons of the United States. He was also connected with the Legion of Honor, Union League, American Medical Association, Pennsylvania Medical Society, Philadelphia County Medical Society, the Pathological Society of Philadelphia, the General Alumni Society of the Medical Department of the University of Pennsylvania, the Alumni Society of Manhattan College, the Medical Club of Philadelphia, the Loyal Legion and Meade Post, G. A. R.

Lieut. Col. Andrew Conover Bergen.

Born February 3, 1849—Died October 3, 1900.

COLONEL BERGEN was born in Franklin, Indiana, but was educated at the Vinton, Iowa High School. He began his medical studies at the Medical Department of the University of Michigan but completed them at the Long Island College Hospital, from which he received the degree of M. D. in 1870.

From 1874 to 1883, he served as Acting Assistant Surgeon in the United States Army, and, upon his resignation, he identified himself with the National Guard of Iowa, of which he became Deputy Surgeon General with the rank of Lieutenant Colonel, further manifesting his interest in military surgery by becoming one of the charter members of the Association of Military Surgeons of the United States.

He was Professor of Pathology and Bacteriology in the Sioux City College of Medicine, a member of the Medical staff of St. Joseph's and the Samaritan Hospitals, and a member of the American Medical Association, the Iowa State Medical Society, the Missouri Valley Medical Society and the Sioux City Medical Society.

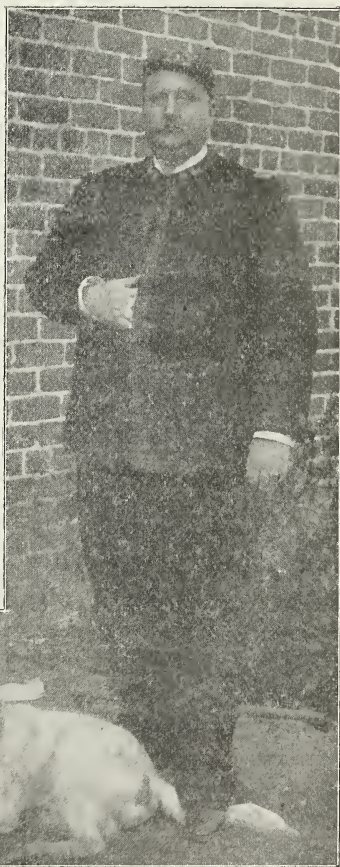
He was preeminently, in the words of a resolution adopted by his home medical society, "an honorable gentleman who

never spoke one disparaging word of a competitor, and always kind and courteous, whether at the surgeon's operating table, in society, or at the bedside of the sick."

Major Frank Thorla Lincoln.

Born July 5, 1856—Died June 28, 1900.

THE light first shown upon Frank Thorla Lincoln in the beautiful southern city of Savannah and in Savannah he passed his days and worked out his career. His father, William W. Lincoln, placed him under tuition at Bogart's Classical School in that place, and then sent him to Hartford, Conn., where he was graduated from Trinity College in 1876 with the baccalaureate degree in arts. He then repaired to the University of Maryland and for three years pursued the study of medicine in the medical department of that institution, receiving his doctorate in 1897. He at once entered upon the practice of his profession in the city of his nativity, where he promptly allied himself with the best professional and social life of his day. He



MAJOR FRANK THORLA LINCOLN.

was a member of the staff of St. Joseph's Hospital and an active participant in the work of the Georgia State Medical Society.

In 1885, he was appointed assistant surgeon of the Chatham Artillery, and in 1893 he was promoted Major and Surgeon. In 1894 he was elected to membership in the Association of Military Surgeons. He was present at the fifth annual meeting in Washington and, by his cordial manner and kindly courtesy made many friends.

In the Yellow fever epidemic of 1894, he was government inspector at Jersey, Ga., and organized and maintained so effective a quarantine that it became the northernmost limit of the disease, not a single case occurring beyond this limit.

He died June 28, 1900, at the Savannah Hospital of heart failure consequent upon grippe, and was buried on June 30, with military honors, his old company, the Chatham Artillery, furnishing the escort and firing the salute.

Lieut. Col. Franklin Gauntt.

Born May 16, 1823—Died July 7, 1900.

ON August 7, 1893, Lieut. Col. Franklin Gauntt of Burlington, N. J., was elected to active membership in the Association of Military Surgeons of the United States. Colonel Gauntt had been surgeon of the second brigade of the National Guard of New Jersey since 1870, and had previously served as a volunteer surgeon in the United States army during the Civil War. He was also one of the surgeons to the Pennsylvania railroad and an alumnus of the Medical Department of the University of Pennsylvania, from which he received his doctorate in 1847.

The Opening Session.

ADDRESS OF WELCOME ON BEHALF OF THE
STATE OF MINNESOTA.

By HON. SAMUEL R. VAN SANT,

ST. PAUL, MINN.

GOVERNOR OF MINNESOTA.

I ASSURE YOU it is a great pleasure to welcome to our State the men here assembled. We have the highest appreciation (I have especially, being an old soldier) of the army surgeon. I do not know that I can do better than to tell a little circumstance that happened early in my life in connection with one of these men. I enlisted forty years ago in the Union army. I was very enthusiastic, especially before I got into camp, but it was so disappointing when I did get there. I supposed we would have pie and cake and all the good things we used to have at home on our table. I remember I used to eat off the rear end of a wagon or the soft side of a board. I knew the surgeon very well. As my name commences with a V, I was way down on the list, and as he had rejected ten of the boys by the time he got to my name I made up my mind I did not care much whether I was rejected or not. He made a very thorough examination of them all, but when he came to me he said, "Run along, Sammy, you're all right." He never gave me an examination. (Laughter.) I readily forgave him, for during the three years I was in the army I never had to take a bit of his medicine. I well remember how kind he was, and how, when we would go to him in the dead of night after a wearisome day's march he would have a cheery and encouraging word for us, and how at any time of

the day or night he would go to the side of our comrades and administer to their wants.

I well appreciate the fact too that you live in this splendid age, and that you have kept up with the progress that has been made in every department.

I welcome you to this great state, and our welcome is as broad as the state is wide. This is an empire in itself. We hear a great deal about Massachusetts, Vermont, Rhode Island and the rest of the New England States, but I tell you Minnesota is larger than the New England states combined with New Jersey and Delaware thrown in. (Laughter and applause). We are only a young state, yet we have more miles of railroad than all of New England combined. Think of it, if we were to populate Minnesota as densely as Belgium, we could take care of forty-four millions of people. We are a healthy state; we hardly need the doctors. The ozone is perfect, the air is invigorating. It is a great state for invalids. I came here an invalid and—well, you know how I look now. (Laughter.)

I want especially to give a welcome to those people from the South Land this morning. This is very appropriate from the fact that this is our great Memorial Day. You are welcome here. This welcome comes from the old soldier, and when you go back tell the people down there that the old soldier up here told you that when he goes south the best friend he meets is the old, grizzled veteran that forty years ago tried to shoot him to death. (Applause). We can afford to congratulate ourselves that we live in this time and have seen the sons of the men who wore the blue and who wore the gray following the old flag and vying with each other in upholding the honor of their country. (Applause).

I can say nothing more to you. You are welcome to the best we have. I am down stairs all the time and if you want anything rectified or things go wrong come down and see me and I will do what I can for you. (Applause). The state is yours, the capitol is yours; you can use these rooms, these buildings and lawns, you can use all you want as long as you

stay, and I hope you will use it well as we hope to use you well. (Applause.)

GEN. JOHN F. FULTON:—I am sorry to say that our mayor is not here, but he is afraid of doctors. I take pleasure, however, in introducing to you Judge Jaggard who will welcome you on behalf of the city.

ADDRESS OF WELCOME ON BEHALF OF THE
CITY OF ST. PAUL.

By HON. EDWIN A. JAGGARD,

ST. PAUL, MINN.

I AM not quite sure that when the Governor was speaking of rectifying things, the full meaning of his metaphor was apparent to you. What the Governor meant to intimate to you, gentlemen, was the cordiality on tap down below in which to cheer and recuperate your depressed spirits. (Laughter.)

The mayor of this city of St. Paul asked me to extend to you his official welcome. A council was held and the question was deliberated whether we should go through the traditional form of presenting you with the freedom of the city, but we supposed that Dr. John Fulton had already made that provision so we did not think it necessary as you already own the town.

Dr. Stone years ago set the standard for efficient health commissioners all over the country. Dr. Stone has made a record in the city of St. Paul which entitles him to do as he pleases with this city, so we concluded it would be a work of supererogation to present you with the freedom of the city. We lawyers stand united in the belief that every man's house is his castle, and the king cannot enter unannounced, but the doctor is mightier than all others for he enters our houses in the capacity of a sanitary inspector whether we will or not. (Laughter.)

Now, to be serious, the people of St. Paul honor the medical profession and we feel happy to have you in our midst. They welcome you with a full and thorough appreciation of

your high purpose and patriotic enthusiasm. They welcome you with the personal knowledge and the observation of the benefits that follow mankind from your ministrations from the cradle to the grave. Then they welcome you because of your cooperation. That, perhaps, is the key note of the day; that, perhaps, is the source of more trouble and travail than all other existing phenomena. It was not a sane man who cried, "Each man for himself and God for us all." Cooperation is a necessary condition of human existence. Cooperation is universal and is necessary to human activity. We know that people cooperate whether they will or not. There was a fallacy once taught and still practiced that theoretical knowledge was of no value, but just stop and think how one man helps another man. When Priestley discovered oxygen did he contemplate its service to science as applied to humanity? and yet that theoretical discovery has been the origin, perhaps, of more human progress than almost any one discovery in chemistry. So I might go on indefinitely in medicine, from the crude things which were hailed as great discoveries down to the present development great men have been cooperating one with the other. But, after all, gentlemen, it is the patient, quiet, every day average man who does the hammering out; it is the ordinary physician who does the work; it is the ordinary physician who comes down from the idea of speculating in the stars; it is the ordinary physician who in the long run causes the development of medicine. It is the register of his experiments, the record of his experience which has established the standing of your profession, the ministration of which is alike the comfort and the glory of our day and race. The world looks upon your profession with a special pride and pleasure. The world honors you as disciples and followers of the highest type of the new philosophy. The world honors you because you have worshipped an idol of authority, because your only God has been the God of Truth. The world honors you because you have searched the extremities of the earth, you have penetrated the recesses of the mountains, you have gone to the

depths of the sea in search of clinical experience and remedial agents. You have done this with a love that was imperishable, with a faith that was unconquerable, a faith that was sublime, and the result has been a benefit to mankind comparable only to the sun whose beneficent rays maintain and lengthen life.

Gentlemen, on behalf of the citizens of St. Paul, on behalf of the mayor of St. Paul, on behalf of the officials of St. Paul, I extend to you a welcome full of heartfelt appreciation of the great good your profession has done. (Prolonged applause.)

GEN. JOHN F. FULTON:—I now have the pleasure of introducing our President, Gen. A. J. Stone, and in introducing him I will say that the whole Northwest appreciates the honor you have conferred upon its people by electing Dr. Stone your president [See page 106.].

The President's Annual Address.

THE STATUS OF THE MILITARY SURGEON.

BY BRIGADIER GENERAL ALEXANDER J. STONE,

ST. PAUL, MINN.

SURGEON GENERAL OF MINNESOTA.

IT IS with great diffidence that I undertake the task of presiding over the deliberations of this Association composed, as it is, of men whose reputation is coextensive with scientific progress throughout the world and I should indeed falter did I not know the generosity that invariably accompanies moral and mental strength and which will treat with leniency any failure upon my part.

It is my pleasant duty to welcome you to this State and City on behalf of the members of the medical profession and I can only regret that I have not the wit and eloquence of my predecessors with which to convey to you the admiration which the profession have for your past achievements and the personal love which they feel towards many of you for the self sacrificing devotion with which you have proven your love for your country as well as for your fellow men.

It is their pride that a few from their own number have proven their devotion to our flag by sacrificing in a modest way that which many of you have in much fuller measure and, as they realize more and more the scientific value of the work which has been accomplished in the comparatively short and bloodless war just passed, they more willingly pay tribute to the spirit which prompted the sacrifice.

In this body of scientists they recognize the genius of organization and appreciate the fact that, to those who have gained experience in the care of large bodies of men, must they look for counsel and advice in periods of wide spread

epidemics and that especially to the members of the Army, Navy and Marine Hospital Service must they turn for guidance in the event of the introduction of oriental epidemic diseases.

It is apparently paradoxical that the army surgeon is much less the surgeon and much more the practitioner than the surgeon of civil practice. But a comparatively small proportion of the mortality of a modern war is due to wounds received in battle and the surgeon finds it necessary to become a sanitary expert as well as a surgical operator. It is his duty to know the best location for a camp with its relations to a pure water supply and equally his duty to know how such supply can be contaminated by the camp and its surroundings and to so advise that the sanitation of the camp shall be as perfect as possible and his authority should be such that only the gravest of adverse conditions could overthrow his dictum.

The question of the location of the sinks should not alone be left to his judgment but his orders for prevention of infection from them should be implicitly carried out and such material as he requires be furnished unsparingly.

The experiments of the surgeons of the regular services have proven that through the mosquito are carried two diseases, one tropical and one almost universal, and have also proven that the carrier can be economically and effectually dealt with.

To the mind of the civilian practitioner it is a short sighted policy that so hampers the hand of the surgeon by limiting the amount of supplies or by encircling them with red tape that preventive medicine in its most effective form cannot be practiced.

With the acquisition of our Eastern possessions we have been obliged to cultivate a more intimate acquaintance with the epidemic diseases peculiar to oriental countries, and, again, do we find our teachers in the men of the regular service.

The most dreaded of these diseases of the East has already knocked at our doors and is now, apparently, intrenched at our Golden Gate. Comparatively mild in form, confined

almost entirely to the Chinese quarters of San Francisco, a disease of filth and low vitality, yet it is a menace to the whole nation. Surgeon General Wyman in his wonderfully exhaustive monographic report has pointed out the remedy. It is for the practitioner in civil life to learn the lesson taught by the work done in Cuba, Porto Rico, the Philipines and San Francisco and to become a sanitary propagandist in his state and municipality.

I do not believe that I overestimate the value which a closer affiliation between the army surgeon and the general practitioner would enure to the public. Nor do I undervalue the fact that the surgeon of the National Guard is the intermediary between the two. The laudable ambition of the surgeon of the Guard is to be as thorough, as exact and as conscientious in his work as his brother of the army and to fit himself so thoroughly during his connection with the Guard in time of peace that he may be an efficient ally in time of war.

The social and political relations of our country are such that it frequently happens that he of the Guard has not been able to secure the early educational or social advantages which are to be expected in the regular officers; yet that alone should entitle him to the greater credit for having used wisely those advantages obtained at a later date in life and, in a majority of cases, his appreciation of the deficiency makes him strive the more anxiously to win the approbation of the "Regular."

The Guardsman is constantly in contact with the Public. His official duties occupy but a small portion of the year, yet he goes to his Public with a sense of "noblesse oblige" which is but another evidence of his having, in his official life, imbibed the true spirit of the army surgeon. To his public he carries, not only what the ordinary practitioner learns from the general medical literature of the day; but also that which he has learned from the special medical literature of the army. He goes to his civilian practice better prepared to handle

masses and better qualified to act as mentor and protector for his community.

The present meeting promises to be not only a most valuable one from a scientific standpoint, but also from a social and economic one:

You will act at this meeting upon a resolution, which if passed, will wipe away another evidence that this country was ever divided against itself, and it rejoices my heart to think that I have yet by word or by line to learn of a single objection to the admission of those who, more than a generation ago, fought wearing the grey; but who have, within the past three years, fought for a united country and fought, wearing the blue.

At the last meeting a resolution looking to the establishment of a journal which should be the mouthpiece of this association was referred to a special committee. So far as I can ascertain, such a journal, if established, would be unique. The peculiar character of its papers, all of them more or less specialized, would lend a special charm to its pages which no other journal presents to its readers. Its *clientele* would embrace all who now have, or who have recently, had any connection with Military Surgery, and it is needless to say, the number of such physicians has wonderfully increased within the past three years. It is also to be borne in mind that the medical literature published by the Government is becoming more and more valuable to the lay practitioner, and that many who have never had any connection with military service look more frequently for articles from the pens of military surgeons.

The profession of the City of St. Paul welcome you most heartily to their home, which they love as one of the most hospitable cities in the world and it is with special pride that they ask me to point to the hearty, wholesouled and generous manner in which our citizens have helped to hold up our hands in this attempt to prove to you that you and those who follow you are more than welcome guests; you are honored friends.

Original Memoirs.

A PLEA FOR IMMEDIATE CELIOTOMY IN PENETRATING GUNSHOT WOUNDS OF THE ABDOMEN IN WAR.

By CAPTAIN CHARLES EDWARD BELIN FLAGG,

FORT GRANT, ARIZONA.

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

I WISH here to put myself on record as a military surgeon advocating immediate celiotomy in penetrating gunshot wounds of the abdomen in war. I wish to take this stand because I can not but feel that I will not long be alone in this belief, though, so far as I know, no one else has expressed this conviction and I realize that the whole of military statistics are against it.

When a man receives a penetrating gunshot wound of the abdomen there is no immediate way of determining, without operation, if the abdominal viscera are wounded or hemorrhage is taking place. The accepted military way is to determine whether the abdominal viscera are injured or not by subsequent events, death or recovery, and if the latter, the symptoms during recovery.

It is claimed that perforating wounds of the intestine may close spontaneously and recovery follow. That this is more apt to occur when the wounds are made by the small caliber bullet seems plausible, but is not shown in the statistics I have at hand, for while in the Spanish American War 44 U. S. Regulars were so wounded and 29 died, a mortality of 65 per cent. as ¹against 87.29 per cent. in the Civil War, seeming to show a less fatal result of the small caliber bullet, yet when we take the statistics of the last six wars in which

the large caliber bullets were used, ¹namely: Crimean War, English-French; Italian War, French; Civil War, Federals; Danish War, Prussians-Danes; Franco-Prussian War; and Japan-China War, we have 5490 penetrating abdominal wounds with 3649 deaths, making a mortality of 61 per cent., which is 4 per cent. less than that of our army during the Spanish-American War. ¹During the years 1898 and 1899 116 cases of penetrating gunshot wounds of the abdomen occurred in our army with a mortality of 81, making a mortality of 70 per cent, which is 17.2 per cent. less than the Civil War, and 9 per cent. more than the mortality of the six preceding wars, above mentioned.

Whether the original wound in intestine or stomach is large or small, there can be no tendency to closure of wounds by contraction of tissues, as this contraction is produced by action of the muscular fibers, circular, longitudinal or oblique, and is invariably away from the wound, the muscles pulling away from their severed ends, not pushing towards them. It is possible the wound may be closed by eversion of mucous membrane or by adhesion to the mesentery, omentum or an adjacent loop of intestine. This method of cure is not to be relied upon as statistics show. How often it occurs is a question, and it would seem as reasonable to suppose that in these cases of recovery the intestines escaped injury. However, as this question is a matter of speculation and lacks demonstration, as a mode of cure, it may be left practically out of consideration. These cases (30 to 35 per cent.) that recover, possibly by spontaneous closure of the intestinal wound or more probably by escape of abdominal viscera from injury, ought not to be killed if subjected to immediate celiotomy, and the other 65 or 70 per cent. ought many of them to be saved by it under a skilled operator. ²The Surgeon General's report for the fiscal year ending June 30, 1900, gives the total number of these cases operated on as 10, deaths 9. ²Of the three that I contributed to the list, the two that died would certainly have died without operation as there was no tendency to spontaneous closure of the wounds. One died on the table

of ether poisoning and the other, an insane Filipino, died on account of tearing out of the sutures by the aid of lumbricoid worms. The third, shot through the lung and abdomen, escaped intestinal perforation and was not killed by the laparotomy that was done on the field or by the transportation commenced before the patient was out from the ether. Civil surgeons are not deterred from operating on these cases of abdominal wounds because of the great mortality. Some may be saved and as our operative statistics increase in number they may show better results.

It is generally conceded that these cases occurring in civil life must be operated upon without delay and before extensive infection has taken place from intestinal leakage into the peritoneal cavity and this is equally applicable in the field. This is one of the few operations required to be done on the battle field. The only excuse for not operating is that we cannot have suitable conditions. The question of transportation of these wounded must be considered. Transportation is better borne by a case of intestinal perforation properly closed with sutures, after laparotomy, than by the same case with unclosed intestinal perforation. The requisites for the operation are: 1st. A surgeon who is familiar with the technique of abdominal work. 2nd. Necessary surroundings and appliances. Shelter, heat, water, light, surgical instruments and dressings, a person capable of administering an anesthetic, and, preferably, one trained assistant, are needed. A house or tent affords the necessary shelter and it is very rare that one or the other is not available. Heat can be obtained by means of a Sibley, coal oil or alcohol stove carried for the purpose. Water can be boiled in the operating room, or outside on an open fire. Cold sterile water may be kept in canteens. When daylight is not available a lamp or candle will suffice as it often does in civil life. A table may be improvised of a litter or otherwise. The instruments and dressings supplied to regiments by the Medical Department, U. S. A., are entirely sufficient for this work and are easily transported. If an anesthesiologist is not at hand spinal cocainization can be employed.

If asepsis can not be secured these operations should not be done, nor should operations of any kind be done. If asepsis is lacking, it is, in nine cases out of ten, due to the lack of energy, foresight or training of the surgeon and should be condoned no more than a lack of quinine in a tropical campaign.

As to lack of time; the proportion of abdominal wounds to other wounds is small and it is conceded that all operations that can with safety to the patient be postponed, should be done at the base. The time then that is consumed in abdominal operations would be taken from the important but not intricate procedure of applying the contents of first aid packets, a procedure taught to every soldier of the line in our army, or from the heroic and commendable act of carrying the wounded out of the line of fire to places of safety, or, possibly, from the administration of beef tea, aromatic spirits of ammonia or other stimulant; all necessary procedures but not requiring the skill or judgement supposed to be possessed by the army surgeon.

No drainage would be required in these celiotomies and hence the danger of infection from redressing en route to the base, a very real and imminent danger, would be avoided.

Be it distinctly understood that it is far from my purpose to suggest that every doctor connected with the army, under whose care a perforating gunshot wound of the abdomen might come, should immediately open all such cases. If a surgeon has not been trained in such work on the lower animals or as 1st assistant to an abdominal surgeon it would be as well for him to let those cases die undisturbed, with, however, the distinct understanding on his part that the non interference is due to an inability to do this work, off as well as on the field, and not to "lack of time," "almost insurmountable difficulty of securing asepsis," etc., etc.

REFERENCES.

¹ Military Surgery by W. C. Borden, M. D., Capt. Med. Dept., U. S. A., etc., from the Philadelphia Medical Journal, 1900, reprint, page 44.

² Report of the Surgeon General of the Army to the Secretary of War for the fiscal year ended June 30, 1900. Page 297, and 323.

Against the argument that a surgeon capable of doing this work is seldom available where these injuries are received I have little to say, but I protest against the commonly accepted teaching that there are insurmountable difficulties in the way of rendering effective aid to these cases.

Fort Grant, Arizona, February 1, 1901.

DISCUSSION.

LIEUT. COL. J. D. GRIFFITH, MO.—I have heard with a very great deal of interest the paper that has just been read, and let me say that it fills a place that has heretofore not been occupied. That an active interference early in a gunshot wound of the intestines is necessary, is beyond any doubt as a rule. But I do think, that under these circumstances there is no rule, because it is a very hard matter to acquire just what is necessary; in other words, to get a tent, to find a house, or get up to a temperature of 88° or 96°, which is preferable in laying a belly wide open and frequently hunting for half an hour or more for an opening you may have left; in other words you have got to strip the gut from one end to the other. Your humble servant has been placed in this position and knows thoroughly what it means, and I can assure you that when at the post mortem examination I have found that I left a wound unattended it caused a feeling of chagrin, when the coroner made his report. Now let me say, this non-interference with abdominal wounds on the firing line was probably fashionable in the Spanish-American running match. Is that right? I can assure you, gentlemen, that when Nicholas Senn spoke of this matter so forcibly he meant that the surroundings were such that it could not be done scientifically. Dr. Senn will probably himself tell you that he has hunted for an hour for one of these wounds of the gut. The smaller the wound the harder it is to find. And then again, every man that has gone into this kind of thing, (and I see one or two gentlemen who have, especially from my own city), will tell you the same thing, that it is hard to surround yourself immediately with just what you want. Asepsis is not an easy thing to get under such conditions. In an operating room you have every requirement you need, all the scrub brushes, hot and cold water you want. It is a hard matter sometimes to determine, and I don't know, but it strikes me that the fatalities that are spoken of as resulting in the last six wars were those which were taken to be intestinal wounds

where the abdomen was perforated and the gut was not touched. Capt. Flagg says in his paper that there was no evidence of either the one or the other if I remember rightly. The paper has not covered the ground entirely. It is not what we want. Let us have the ground completely covered; that is what I mean.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—There is one thing I would consider in connection with this discussion, and that is the remark Col. Griffith has just made in regard to determination of the diagnosis. In my letter to Capt. Flagg I said I was opposed to diagnostic explorations on the firing line, and I believe ninety-nine one-hundredths cases could be determined on simple diagnostic principles.

LIEUT. COL. R. J. FITZ GERALD, Minn.—I concur with the remarks of Col. Hoff. After twelve months in the tropics, doing work in the abdomen following gunshot wounds I found the best results obtained were in those cases that were treated on the expectant plan. It was found that where early operations were resorted to you not only had the shock of the primary wound, but that also of the following operation, and it was found that in a large percentage of the cases they ultimately succumbed, not only as the result of the shock, but as the result of early interference. The rule followed by myself and others in Manila,—and I would first add that nearly ninety-five per cent of the wounded were immediately passed to the first reserve hospital in Manila during the first three months of the insurrection, and we had ample opportunity to observe the results of the treatment of these cases, but the rule was invariably followed to allow the patient sufficient time for reaction; and sometimes if hemorrhage did not exist it was found necessary to make an opening large enough to establish drainage, and drainage was made in the abdomen, and this treatment gave the best class of results. Nearly all cases that were operated on early after the injury died, but a fair percentage of the cases treated as I have mentioned made a fair recovery. In many cases subsequent operations were necessary, but in the ultimate the results were fair. I do believe, as the author of this paper should know from experience in the Philippines, that an early operation is certainly contraindicated and is condemned by every man who has had experience in this line.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A. (*Closing discussion*).—I have nothing to say in regard to this matter. I had made up my mind so far as my reading, experience and the ob-

servation of the cases of people who have had a larger experience than I that all things seem to point to the fact that any operation that was not absolutely necessary to save life was not justified, at least in the field hospital. As I said before, exploratory procedures for diagnostic purposes I do not think are justified under any circumstances. I am very certain Capt. Flagg has not a more enthusiastic advocate of his views than the gentleman who read his paper, but I must say, as I told him, that I do not agree with the proposition he advances.



SUPRAPUBIC OPERATION FOR VARICOCELE AND
OTHER CONDITIONS OCCURRING WITHIN
THE SCROTUM REQUIRING SUR-
GICAL INTERFERENCE.

By MAJOR ALFRED E. BRADLEY,

FORT SNELLING, MINN.

BRIGADE SURGEON OF VOLUNTEERS; CAPTAIN AND
ASSISTANT SURGEON, U. S. ARMY.

ALL works of reference at my disposal fail to mention any but the scrotal route in operations upon the contents of the scrotum. It is possible and probable that many operators have used the high operation but in view of the fact that it has not been described nor alluded to in standard works on surgery it is fair to presume that it is a new method of procedure, and as such and possessing as it does undisputed advantages over the scrotal route it is considered a subject which may be of interest to all surgeons.

On December 22, 1900, I made a brief report to the Surgeon General, U. S. Army, of three cases in which I had used the suprapubic method for varicocele which will be found as part of Circular, No. 3, Surgeon General's Office, dated February 22, 1901.

This circular contains several reports from other medical officers and is herewith given in full.

CIRCULAR, } WAR DEPARTMENT,
No. 3. } SURGEON GENERAL'S OFFICE,
Washington, February, 27, 1901.

The attention of medical officers is invited to the accompanying papers relating to varicocele and its cure by surgical intervention. The rule laid down in Tripler's Manual should govern medical officers in the examination of recruits, viz,

that a candidate for enlistment should be rejected if he has a varicocele which is larger than the sound testicle. If, however, upon a subsequent examination, after enlistment, a recruit is found to have a varicocele as large as or larger than the sound testicle and complaint is made of disability arising from it, this should not be considered a cause for discharge, but for surgical treatment.

In this connection attention is invited to the following decision published in Circular No. 11, Adjutant General's Office, Washington, December 10, 1884:

Except in case of a capital operation involving the risk of life, a soldier can not refuse to submit to medical treatment or surgical operation without subjecting himself to trial by court-martial for wilfully avoiding treatment the purpose of which is to enable him to perform the duties for which he enlisted.

*Report of Lieut. Col. A. C. Girard, Deputy Surgeon General,
U. S. Army General Hospital, Presidio of San Francisco,
Cal., January 11, 1907.*

The pubes are carefully shaved the day before operation; a soap poultice is applied and the patient kept in bed. Next morning after the patient has been etherized, the pubes are scrubbed with soft soap and warm sterilized water, washed with warm sterilized water, then with alcohol and then wiped dry. The finger is introduced by the spermatic cord into the inguinal canal until the external ring is felt. An incision is then made corresponding to the axis of the canal, one inch long, the upper end ending over the external inguinal ring. Superficial and deep fasciae are divided with angular scissors, preferably over a Kocher director. The vessels of the cord then come into view. The finger is passed under the cord by a little blunt separation and the cord is raised out of the wound. The spermatic duct and artery are returned as soon as possible into the bottom of the wound to prevent accidental injury. A sound vein selected for preservation to return the blood from the testicle is carefully separated from the strand of veins and carried alongside the duct. The veins are then dissected from the connecting tissue for a distance of about two inches, ligated with small sized catgut at the end of these dissections and cut off between the ligatures which are left three or four inches long. The ligatures are then tied together, the upper and lower ends of the veins being approxi-

mated, and for further safety threaded to needles and the ends united by stitches and finally anchored to the external pillar of the ring. The deep and superficial fasciae are then carefully and separately united with a continued catgut suture, and the skin by a subcuticular suture of silkworm gut.

After a little practice this operation takes only a few minutes. The advantage over the Volkmann operation is that the seat of operation can be made absolutely sterile, which is almost impossible in the scrotum; that the scrotal tissue, being of a loose character and readily infiltrated, becomes a nidus for infection; that the scrotal scar will always be more or less tender, inconvenient and unsightly, while the suprapubic scar practically disappears, is invisible and not tender.

Sixteen cases have so far been operated on at this hospital. The men all recovered without any drawback and were returned to duty. Three of the men belong to the Hospital Corps and are now on duty at this hospital. They do not feel the slightest inconvenience from the operation, consider themselves practically cured, and there is nothing visible to show that they have ever had an operation performed. Special reports were transmitted in each case at the end of the month during which the operations were performed.

Below is a list of men showing hospital number, name, organization, and date of operation.*

The idea of this operation was first received from Dr. C. R. Krone, of Berkley, Cal., although I am informed by Colonel Forwood that this has been his method of operating at the U. S. Soldiers' Home, Washington, D. C.

The operation is easy and, if necessary, the patient might be discharged from hospital in two or three days, while scrotal operations, as a rule, take longer to heal.

Report of Maj. J. M. Banister, Surgeon U. S. Army, U. S. Military Academy, West Point, N. Y., January 12, 1901.

All surgeons who have been in practice a little more than a decade have seen a great revolution in the operative technic for the radical cure of varicocele. Before the advent of modern aseptic methods our attempts at the cure of this condition were bungling, imperfect, and unscientific, and as a consequence our results were unsatisfactory and uncertain. Such procedures as the amputation of the redundant scrotum; the subcutaneous passage of a silver wire around the veins, or pre-

*It is not considered necessary to publish this list. The first reported case was operated on October 10, 1899, the last November 14, 1900.

sumably around the veins, and the fastening of the ends of the wire to a button or yoke, applied at the point of their exit from the scrotum, with a daily tightening of the wire loop until the tissues in its grasp were cut through: the subcutaneous use of a silk ligature around the veins, which was tied tightly and the knot pushed into the scrotum were recommended and practiced. All these methods I have tried, but I am free to confess that my results were not satisfactory and in those days I never attempted the cure of varicocele with the slightest feeling of confidence. Now, thanks to modern aseptic technic, the skilled surgeon no longer works blindly, but by the open method exposes the enlarged veins, ligates and excises them to the needed extent, closes the wound and confidently expects first union and a perfect cure. The technic which I have pursued for some years in the surgical treatment of varicocele will now be described, but I wish in advance to disclaim any originality in this matter, as in working in this line I have been simply following in the steps of Professors Halsted and Bloodgood, of Johns Hopkins University.

The patient is prepared as for any other aseptic operation requiring the administration of an anaesthetic. The day before the operation he is placed upon a liquid diet and given a saline purge. Operating, as I do, almost invariably in the afternoon for reasons of convenience the patient early on the morning of the operation is given a cup of broth which is to be his only food that day. He is then required to take a bath, the hair on the pubes and scrotum is shaved, and a wet bichloride dressing applied. After the patient has been etherized and placed upon the operating table the antiseptic dressing is removed and the region of the operation including the scrotum is thoroughly scrubbed, first with soap and water then with ether and finally with a solution of bichloride of mercury, 1:1000. The patient is then covered with sterilized towels, the site of the proposed wound in the groin only being uncovered. The hands and arms of the surgeons and assistants having been sterilized and all those assisting in any capacity being dressed in freshly sterilized linen gowns and trousers the surgeon commences the incision just above the spine of the pubic bone and carries it upwards and outwards for about an inch and a half or two inches, somewhat parallel to Poupart's ligament. I seldom make a longer incision than the one first designated. After dividing the skin I grasp the underlying layers of fascia with a mouse-toothed forceps in one hand and with a dull dissector in the other tear through

the layers until the external abdominal ring is exposed and the tunica propria of the cord comes into view, the layers of fascia being exposed throughout the whole extent of the wound. During this procedure the wound is held open by means of two small retractors. When the cord contained in its proper sheath has been clearly exposed the sheath is seized with the forceps and divided longitudinally when the large veins constituting the anterior portion of the cord become visible. The vas deferens and other structures of the cord, behind this group of veins must be interfered with as little as possible. This anterior group of veins should now be grasped between the fingers at the lower extremity of the wound and pulled upwards so that a portion of their extent contained in the scrotum near the upper termination of the pampiniform plexus may be brought into plain view in the wound. This can be done with the greatest ease and with the gentlest traction. What is desired by this maneuver is the drawing up of the enlarged and tortuous portion of the veins from the scrotum into the wound for ligation and excision. Having brought the veins to be treated into view they are held by a pair of forceps in the hands of an assistant or upon a blunt hook passed under them and an aseptic silk or kangaroo ligature is passed around them en masse at as low a point as desired, tied tightly and one end of the ligature cut off, the other end being, for the time, left uncut. The same veins are similarly treated at a point about an inch and a quarter higher up and the portion included between the ligatures excised and removed. The uncut ends of the ligatures are now tied thus drawing together the severed ends of the veins not with the object of securing end to end union, which would be impossible, but with the expectation that the testicle will be temporarily held up until adhesion shall have formed. After being thus treated the veins are pushed down into the scrotum where the ligatures can be easily felt between the thumb and finger. The wound is then closed either by interrupted sutures of silk-worm gut or by a subcuticular continuous suture of kangaroo tendon, which latter is now my favorite method of closing aseptic skin wounds. The wound is dressed with dry aseptic gauze and cotton and the whole held in place by a gauze spica bandage. The testicle which is not covered by the bandage, is supported during the period of confinement to bed and a suspensory bandage is ordered for constant use for a few months after complete recovery. The wound is redressed in one week when the sutures are removed if silk worm gut has been used. The patient is allowed to sit up in ten days. For a

time there will be a swelling of the obliterated veins below the ligature but this rapidly subsides and soon only a small lump can be detected in the scrotum.

Report of cases.—I have operated quite often in the manner described, having at times performed two varicocele operations at one sitting. The complete records of my operations performed elsewhere are not available, but I have the records of sixteen operations for the radical cure of varicocele performed at West Point, N. Y., which with the exception of case 4, are almost identical in results with those previously performed. In all my cases operated upon before my coming to West Point there was *first union, a complete cure of the varicocele, and no atrophy of the testicle.* This much I know, although I have not the names of the patients nor the histories of the cases at hand. The histories of the sixteen cases operated upon at West Point will now be given:

Case 1.—Cadet C. B. C. Operation by high incision, January 10, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure February 1, 1899. This cadet left West Point February 15, 1899, in consequence of graduation and is now an officer on duty in the Philippines.

Case 2. Cadet F. P. A. Varicocele, left side. Operation by high incision, March 24, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure May 4, 1899. Graduated in 1900 and is now an officer of the Army. This cadet remained for over a year at West Point after the operation and never had the least trouble up to the time of his departure.

Case 3.—Private R. Van V., Army service detachment. Operation by high incision performed May 29, 1889, in my presence by 1st Lieutenant D. F. Duval, assistant surgeon, U. S. Army. Result, the wound healed by first union, no epididymitis. I have just examined this man, who is still on duty at West Point and find the testicle unaffected. There has resulted, however, a small hydrocele, which gives no trouble of consequence.

Case 4.—Cadet T. N. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size. His military duties in camp caused the veins to enlarge very rapidly, and by August 11 the varicocele had attained a size that made an operation necessary to enable him to remain at the Academy. On the date mentioned I operated in accordance with the method described. The patient did well, the wound healed per primam, and there was no epididymitis. During convalescence the testicle was bruised several times, causing

a little swelling of the gland. This cadet was returned to duty September 2, 1899. A little while after leaving the hospital he received a contusion of the left testicle in the gymnasium, which caused a decided swelling of the gland, though the injury did not give rise to an acute orchitis. I have just examined this cadet sixteen months after the operation, and find a small hydrocele present and the testicle on the operated side somewhat larger than the other. He states, however, that he has never had the least trouble referable to the testicle or scrotum and that he performs his military duties and exercises with ease, a condition in marked contrast to that existing prior to the operation.

Case 5.—Cadet G. R. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which after about two months of duty in camp became increased in size to a degree which prevented him from performing his military duties. On August 14, 1899, I operated by the method described. The wound healed per primam; there was no epididymitis; no swelling of the testicle, and in fact not an untoward symptom. He was returned to duty September 3 with an absolutely perfect cure. I have examined this cadet within the last few days, sixteen months after the operation, and find the result perfect. There is no atrophy of the testicle, no enlargement of the veins, nor any evidence that there has ever been any trouble of any kind.

Case 6.—Cadet R. C. T. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which rapidly enlarged in consequence of the military duties of camp until it became necessary to operate. I performed the operation on August 16, 1899. This cadet made a perfect recovery with no complication and was returned to duty September 3, 1899. I have recently examined this cadet, sixteen months after the operation, and find the result perfect.

Case 7.—Cadet B. B. McC. Like the three preceding cases this cadet was admitted to the Academy in June, 1899, with a moderately sized varicocele, which rapidly increased in consequence of the duties required of him in camp until an operation became necessary. On August 19, 1899, I performed the operation as described. A perfect recovery ensued. There was no sign of any complication during convalescence. This cadet was returned to duty September 3, 1899, with a perfect cure. I have just examined this cadet, sixteen months after the operation, and find the result absolutely perfect.

Case 8.—Cadet J. P. R. Varicocele, right side. Before coming to the Academy this cadet had been operated on by a

civilian surgeon for varicocle on the left side. The incision used at that time was through the scrotum. Adhesions had formed between the cord and scrotal wound, which caused the patient inconvenience, and singularly there had resulted a tendency to sweating on this side, which would be wet with perspiration, while the other side remained dry. A troublesome varicocele having developed on the right side during service at the Academy, this cadet applied to me for operation. I performed my usual operation on October 31, 1899, which was followed by no complication and resulted in a perfect cure. The result of the high operation stood in flattering contrast to that through the scrotal incision. This cadet was returned to duty November 28, 1899, graduated in June, 1900, and is now an officer of the Army.

Case 9.—Cadet N. C. M. This cadet applied to me in November, 1899, for relief from a troublesome varicocele, and I operated upon him November 15, 1899. The wound healed by first union, the cadet recovering without a complication and with a perfect cure. This cadet was returned to duty December 26, 1899, and graduated in June, 1900, being now an officer of the Army.

Case 10.—Private J. S. C. J., Company E, Battalion of Engineers. Varicocele, left side. The high operation was performed by my assistant, 1st Lieut. F. M. Kemp, assistant surgeon, U. S. Army, January 11, 1900. The wound healed per primam and a perfect recovery, without a complication, resulted. This soldier was returned to duty February 14, 1900, and is now on duty with his company in the Philipines.

Case 11.—Cadet V. La S. R. On January 16, 1900, I operated upon this cadet in accordance with my usual technic. He recovered without a complication and was returned to duty on February 17, 1900, with a perfect result. In June, 1900, he left the Academy in consequence of graduation and is now an officer of the Army.

Case 12.—Private A. J., detachment of Cavalry. Operated upon by me February 5, 1900. This soldier was returned to duty February 21, 1900. I have examined him within the last few days, eleven months after my operation, and find the final result absolutely perfect. There is no evidence that there has ever been any abnormality in this case.

Case 13.—Cadet F. O. W. On March 18, 1900, the operation by the high incision was performed in this case. The wound healed by first union; there was no epididymitis nor swelling of the testicle, and the cadet was returned to duty

cured May 19, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 14.—Cadet J. W. W. Operation performed March 8, 1900. The case progressed without a complication and the cadet was returned to duty with a perfect cure on April 21, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 15.—Cadet A. P. S. H. Operation performed March 20, 1900. There was not the slightest complication in this case, the wound healing per primam and the patient returning to duty April 18, 1900, with a perfect cure. He graduated in June, 1900, and is now an officer of the Army.

Case 16.—Private C. McL., detachment of Cavalry. Varicocele, left side. Operation in accordance with the writer's technic was performed by 1st Lieut. F. M. Kemp, assistant surgeon U. S. Army, April 10, 1900. The wound healed per primam, there was no epididymitis or other complication and a perfect cure resulted. The patient was returned to duty May 19, 1900. I have within the last few days examined this soldier and find the result absolutely perfect.

Resume.—In reviewing the histories just given it will be seen that in the sixteen cases recorded there has been first union in every case and that there has been no epididymitis as an immediate result of the operation nor any instance of atrophy of the testicle as a final sequence. A perfect result was obtained in fourteen out of the sixteen operations recorded. In one case, No. 4, the testicle on the affected side is at the present time, sixteen months after the operation, found to be somewhat larger than its fellow gland and a small hydrocele is discoverable. The patient, however, considers his cure perfect. Another case, No. 3, shows a moderate hydrocele, which is of no practical importance as it does not interfere with the performance of the soldier's duty.

General considerations.—Among my own cases and those of my former junior colleagues, Assistant Surgeons W. F. Lippitt, John H. Stone, and Basil H. Dutcher, which were subjected to operation before my coming to West Point, and which are not included in the histories given above, I have never known of a single case that did not result in a perfect cure. In 1897 I saw one case, which had just been operated upon by one of my colleagues mentioned, in which the scrotum was distended with blood, presumably from a slipping of the lower ligature. This was remedied by the surgeon who performed the first operation, and I was informed that an excellent result had been secured.

It can be appreciated, therefore, that when carefully performed the operation for varicocele is one of the most successful of surgical procedures, and that its possible disadvantages are so slight as to justify the surgeon in ignoring them when called upon to decide as to the advisability of operating in a given case. The high incision with the ligation and excision of the veins is without question the ideal operation for varicocele. It has decided advantages over the incision through the scrotum with few of the disadvantages of the latter.

The advantages of the high incision are:

1. The scrotal portion of the enlarged veins can be reached with the greatest ease through a small incision placed at the point of election.

2. The results of the operation through the high incision are better than those obtained by means of the incision through the scrotum.

Dr. Bloodgood's statistics are as follows:

Incision in the scrotum, 16 cases. Ultimate result in these cases: Lost track of since operation, 10 cases: testicle normal, 4 cases; small hydrocele, testicle normal, 1 case; complete atrophy of the testicle, 1 case.

Incision in the groin, 29 cases. Ultimate result in these cases: Lost track of, or recent cases, 12 cases; no atrophy of testicle, 12 cases; hydrocele, 5 cases; atrophy of testicle, 0 case. Healing of wounds, scrotal incision per primam, 12 cases; suppuration, 4 cases. Healing of wounds, incision of groin, per primam, 27 cases; suppuration, 2 cases.*

3. First union can almost certainly be counted upon in the high incision. *In my personal experience I have invariably secured union per primam in my varicocele wounds when located in the groin.*

The disadvantages of the incision through the wall of the scrotum are the following:

1. The difficulty of securing perfect asepsis, owing to the locality of the wound.

2. The tendency of the contractions of the dartos to drag on the wound causing gaping, thus opening the way for pyogenic infection.

3. Greater liability to atrophy of the testicle.

Referring again to my own statistics, I can say that I have never seen a case of epididymitis, or atrophy of the testicle, resulting from a varicocele operation performed by me. My results have been absolutely perfect, except in case 4, where traumatism occurred during and after convalescence, and in the case cited the relief from former inconvenience is

*See Dr. Jos. C. Bloodgood's paper in "The Johns Hopkins Hospital Reports, Vol. VII," page 350.

at the present time so great that the patient considers himself cured.

I conclude this paper by advancing the following propositions:

1. The operation for the radical cure of varicocele by the high incision with ligation and excision of the veins is one of the most successful of surgical procedures.

2. The operation is without risk to life in the case of a patient without disease of vital organs.

3. That it is well adapted to the military service.

4. That no soldier otherwise sound should be discharged from service on account of varicocele.

5. That it should be the duty of the Medical Department of the Army to cure these cases, compelling compliance on the part of the soldier where objection is urged.

Report of Capt. W. C. Borden, Assistant Surgeon U. S. Army, U. S. General Hospital, Washington Barracks, D. C., February, 9, 1901.

I have operated for varicocele in twenty-two cases and have used two methods—subcutaneous ligation and excision. The cases by subcutaneous ligation were thirteen in number and were done several years ago. This method I no longer consider worthy of consideration as it has been entirely superseded by the more accurate and satisfactory method of operation by excision.

Operation by the open method with excision of the veins.—In operating by this method one of two incisions may be practiced—above the pubes over the external inguinal ring or through the front of the scrotum. I have used both incisions, having operated about an equal number of times by each and believe the suprapubic method to be by far the safer for general work but in certain cases, where the scrotum is quite long and relaxed, I prefer the incision through the scrotum when I am absolutely sure of my asepsis. The operation for varicocele is one which requires extreme care in the aseptic technic and this is particularly the case if the operation is done through the scrotum as the laxity of the tissues, the deep rugae of the skin, and the deep sebaceous glands in this region tend to harbor infection which, if it occurs, is invariably followed by prolonged suppuration and sinuses which have no tendency to heal thus necessitating a secondary operation. Aside from the prolonged suppuration which follows infection, this is dangerous to the testicle in that the inflam-

mation about the blood vessels may seriously interfere with the organ or may even infect it and produce atrophy.

In my nineteen cases operated upon by the open method primary union was obtained in all but one case. This case was operated upon by the scrotal route. It occurred at this hospital and was the first surgical case I operated on here. At that time the conditions were not favorable to absolute aseptic work and this, in connection with the incision through the scrotum, accounted for the infection. Fortunately the infection was not severe and I am inclined to believe that, other conditions being equal, had the operation been done by the suprapubic route no infection would have occurred. With asepsis thoroughly under control the scrotal route may be chosen in certain selected cases especially in those in which the scrotum is elongated, for by sewing the incision transversely the scrotum may be shortened. But as the main danger in the operation for varicocele arises from infection of the wound the suprapubic method is to be preferred when most rigid asepsis is required.

Aseptic technic.—The patient is prepared by shaving the pubes, scrotum and adjacent parts and applying a dressing of green soap the night before the operation. Green soap is preferred to a bichloride dressing in that it loosens the epidermis and allows a thorough cleansing. The patient having been placed under an anesthetic the parts are thoroughly scrubbed with green soap. They are then rinsed with sterile water, scrubbed with alcohol, then with bichloride solution 1:1000 and rinsed with sterile water. The penis is carefully enveloped in a sterile cloth and the operator and his assistants all wear rubber gloves. I now use rubber gloves in all my operations and consider them of the greatest value in furthering asepsis.

The operation by the superapubic route.—The incision is made above the pubes and over the external inguinal ring, nearly parallel to Poupart's ligament and about an inch and one-half in length. It is carried down until the external ring is exposed and the cord brought into view. The sheath of the cord is now opened and the veins which lie at the anterior portion of the cord are seen. In varicocele the enlarged veins lie at the anterior part of the cord and in front of the vas deferens and spermatic artery. If care be taken these veins can be lifted up and away from the vas deferens and artery and isolated from the latter by passing a blunt hook beneath them. Having done this the veins can be separated by blunt dissection from the underlying structure of the cord well down to-

ward the testicle by pulling them up as the dissection proceeds. Having done this, the operator should determine the position of the vas deferens and artery to be sure that he does not include them in his ligature. The veins being brought well out through the incision a ligature is passed about them above and another ligature is tied about them below well down toward the testicle. The intervening portion is excised and the cut ends approximated and tied together by the ligatures. The wound is now closed by a subcuticular suture of catgut, covered with sterile gauze, cotton and a spica bandage.

Dangers of the operation.—The danger of infection has already been discussed. The remaining danger is atrophy of the testicle from inclusion of the vas deferens or spermatic artery in the ligatures. This the operator must be careful to avoid and is easily done by careful attention to the structures involved before the ligature is passed.

Operation by the scrotal route.—As before stated, this operation is not advised except in special cases and when the operator is absolutely sure of his aseptic technic. The operator standing on the left of the patient grasps the cord between the thumb and forefinger of his left hand, pressing the cord up to the anterior surface of the scrotum and holding the testicle retracted in the palm of his hand. Holding the knife in his right hand, he makes an incision about an inch long through the skin and cuts carefully down to the cord which he is pressing upward with the left thumb and forefinger. By holding the cord firmly to the front of the scrotum in the manner indicated and cutting carefully the distended veins are soon brought into view and this with much less dissection and consequent disturbance of the tissues than occurs when the incision is made into the body of the scrotum and the cord searched for. The veins having been brought into view the operator, still holding the cord to the front with his thumb and forefinger, frees them to a sufficient extent to pull the cord out of the incision. Having done this he holds aside the vas deferens and separates it from the enlarged veins. The most difficult part of the operation now begins. The operator grasping the cord feels for the pulsation of the artery and, having found it, dissects the artery free from the veins. This is sometimes quite difficult and troublesome to do, but the artery should by no means be included in the ligature with the veins as atrophy of the testicle will very probably result. Having separated the vas deferens and artery from the veins, the latter are freed well down to the testicle and well up to the external inguinal ring. A catgut ligature

is then passed around the veins above and tied, the ends of the ligature not being cut off. The veins are ligated below in a similar manner and the part between the stumps excised. The stumps are approximated and tied together, using the ends of the ligature for this purpose. This raises the testicle higher in the scrotum than it was before the operation and does away with the sagging of the organ. The skin wound is closed by subcuticular catgut suture or with interrupted suture or horsehair. A dressing of sterile gauze covered with absorbent cotton is placed over the closed wound and a suitable bandage is applied.

Results of operations.—The results of the operation are always good, provided it is done aseptically and the operator does not include the vas deferens or spermatic artery in his ligature. In my nineteen cases I had one infection which, as stated before, was slight and did not lead to any serious trouble. So far as I know there was no atrophy of the testicle in any case and cure was radical in all.

General conclusions.—As a result of my experience I am of the opinion that a varicocele which produces disability and which has originated in the service should not be considered a cause for a discharge, but should always be operated upon provided the operator is so situated that he can be reasonably sure of asepsis.

Report of Capt. A. E. Bradley, Assistant Surgeon U. S. Army, Fort Snelling, Minn., December 22, 1900.

A description of the method of operation in these cases cannot be found in any text book available, but I am not prepared to claim that it is new. I was prompted to employ it in the first instance in the case of a soldier concerning whom the surgeon of his post persistently claimed the existence of hernia. Reports of this case, Private C. R. L., Troop H, 1st Cavalry, were forwarded August 15 and October 26, 1900.

In view of the opinion of the surgeon at Fort Meade, S. Dak., it was deemed advisable to expose the inguinal canal and the abdominal rings and at the same time operate for the varicocele the existence of which was evident. An incision about two inches long was made in the line of the inguinal canal well down towards the base of the penis. The cord was exposed external to the external ring and easily drawn forth with the mass of varicose veins. The testicle itself was drawn out and fully exposed with great ease. The veins were excised, the stumps drawn together shortening the cord and the

testicle replaced. The abdominal rings and the canal were found normal. A few catgut sutures closed the deeper structures and subcuticular silkworm gut suture the skin incision. A collodion dressing was applied and convalescence was normal.

Case 2.—Trumpeter L. E. S., Troop G, 1st Cavalry, was admitted from Fort Yellowstone, Wyo., October 20, 1900, for operation for varicocele. In view of the ease of operation, as I found it in L's case, I determined to use the same method. The usual preparations were made and I operated October 21, 1900. A small incision was made as before, the cord exposed and dragged up and out, the veins ligated and excised, with out, however, delivering the testicle out of the incision. The wound was closed as in the first case and the result was perfectly satisfactory.

Case 3.—Sergeant J. W. M., Company A, 8th Infantry, was admitted to hospital, October 8, 1900, for chronic sciatica, and while in hospital expressed a desire to be operated upon for varicocele. Operation was performed as in case 2 with a perfect result.

I believe this method to have advantages over the scrotal method. There is greater probability of perfect preparation and less danger of wound infection. The wound is well up on the pubes and away from sources of infection.

The difficulty of avoiding wound infection in scrotal work is well known. Owing to the thin and relaxed wall of the scrotum and the cremaster action, it is difficult to keep perfect apposition of the parts divided in the scrotal operation. In the high operation this is avoided.

Extracts from a paper by Lieut. Col. Nicholas Senn, Chief Surgeon U. S. Vols., chief of operating staff with the army in the field; from his work on the Medico-Surgical Aspects of the Spanish-American War.

For years I have been convinced that too many operations are being performed for varicocele, and I have always advised my students to limit operative intervention to the exceptional cases in which well marked symptoms warranted such a course. Most of the persons suffering from this affection that apply to the surgeon for treatment are sexual neurasthenics, young men who have made a deep study of this subject with the aid of quack literature. In the great majority of cases the symptoms presented are due to a morbid mental condition rather than the varicosity of the spermatic veins. I have frequently

observed that the size of the varicocele bears no relation to the degree of suffering and distress complained of by the patients. Recent experience has only confirmed my views concerning the relationship of varicocele to the subjective symptoms associated with this condition. During the month of May I had, as a member of the examining board, an opportunity to examine, at Camp Tanner, Springfield, Ill., 9,815 recruits for the volunteer service. I took special pains to investigate varicocele as a cause of disability. From the very beginning I was surprised at the prevalence of this affection. I classified the cases according to the number and size of the varicose spermatic veins into (1) small varicocele, (2) medium-sized varicocele, (3) large varicocele. The disease was found more frequent in the robust strong than in men of slight build. In most instances the men were otherwise in excellent condition. Atrophy of the testicle was seldom noted. The subjects of large varicocele were invariably questioned as to whether or not this pathological condition gave rise to discomfort or pain, and, with the exception of three or four cases, the replies were always negative. In more than half the cases that presented themselves the men were ignorant of the existence of the affection. * * * The result of these observations led me to the conclusion that varicocele is very seldom a cause of disability for military service, and that operative treatment is rarely indicated. This short communication is made for the distinct purpose of calling attention to the frequency with which varicocele is met with in otherwise healthy and robust subjects and in formulating a serious and positive protest against the too frequent recourse to operative interference so common with surgeons of all grades and in all civilized countries.

The following table shows that of 9,815 recruits examined 2,078 were affected with varicocele, that is, 21.17 per cent. * * * These statistics are absolutely reliable and fortify my position taken in this paper that varicocele in varying degrees is met with in nearly one out of four men between the ages of 18 and 30 years, and that of itself it seldom gives rise to any noticeable disturbance, and that the patients who apply for treatment do so in consequence of nervous disturbances entirely separate and independent of the enlarged spermatic veins. I am satisfied that in many of these cases an operation is superfluous, provided the surgeon can secure the full confidence of the patient, which is an essential prerequisite to successful treatment short of an operation. For

my own part I shall not perform as many operations for varicocele since I have had an opportunity of studying the pathologic and clinical features of this affection on such a large scale.

[Signed] GEO. M. STERNBERG,
Surgeon General, U. S. Army.

It may be seen that other operators than myself had been using the suprapubic route for varicocele and while it was a new method so far as I was concerned it was originated by some surgeon not known to me. From these reports it will be seen that Colonel Girard has been doing this operation at least since October 10, 1899, and Major Banister since January 10, 1899, while Major Borden gives no dates.

Since this report was published I have operated on four other cases for varicocele by the high operation all giving satisfactory results so far as known. In one case, an officer, in whom I permitted too much freedom after operation there was slow convalescence in which a mass of inflammatory material developed at the site of the excision of the veins and which persisted some time before the patient could be about. This case taught me that quiet should be enforced after the operation and too many liberties early in convalescence, getting up for using the close stool or going to a closet, should be discouraged; the bed pan and urinal should be insisted upon, and quiet in bed enjoined for at least one week.

In one of these four cases there was double hydrocele, small however and not sufficient to ordinarily warrant interference. On the left side after excision of the veins, the testicle and the hydrocele were easily delivered out of the incision and inspected. A small incision was made in the sac, the fluid evacuated and the sac wiped out by a small swab of cotton dipped in pure carbolic acid after which the incision was closed with catgut and the testicle restored to its normal position in the scrotum. The right hydrocele was tapped by a hypodermic meedle and the sac walls scarified or scratched with the point of the needle. The patient returned to duty about ten days after operation; the varococle and the left

hydrocele have been obliterated but fluid has again accumulated in the right sac. Convalescence was normal in this case.

In one case of tubercular testicle I performed castration by the suprapubic method. The testicle was easily delivered through the small incision, and as much of the cord as possible was drawn down before excision. Convalescence was normal and satisfactory in every respect. In this case there was no varicocele but the operation of castration having been proposed to the patient and accepted by him the suprapubic route was chosen as being both feasible and as preferable to the usual scrotal operation.

In another case while performing a Bassini operation the testicle was delivered out of the incision for examination and in many other cases the ease with which delivery could be effected has been demonstrated. In these cases where the testicle is exposed no difficulty whatever has been experienced in reducing it to its normal position. The ease with which it can be exposed and replaced through a small incision was to me at first quite surprising.

After careful aseptic preparation I make an incision above the pubes over the external ring from an inch to an inch and a half long. Before making the incision the cord can be located by palpation and the division of the tissues made directly over it. Ordinarily there is no hemorrhage and the incision is deepened until the sheath of the cord is reached when it is opened. Should any difficulty be experienced in locating the cord it can be readily discerned by passing the tip of a finger in the wound from side to side the cord being thus easily felt. In varicocele the enlarged veins frequently present into the incision and can be picked up, drawn out, isolated and excised without disturbing the vas deferens and spermatic artery which usually lie posterior to the enlarged veins. These veins are separated by blunt dissection and tied off by two catgut ligatures one from half to three-fourths of an inch above the testicle, the other two inches or more above sufficiently to include the mass of veins. The veins thus ligated off are excised and the stumps drawn together by the liga-

tures which are left long for this purpose. After tying the approximation is made more perfect by threading the ends of the ligatures on needles and taking a few continuous sutures. This shortens the cord and supports the testicle. The cord is now replaced in the sheath which is closed by a fine catgut continuous suture; the deeper tissues are approximated by continuous catgut and the skin by subcuticular silk worm gut, a sterile cotton collodion dressing is applied and the scrotum supported by a suspensory bandage. In a week the dressing is removed, the silk worm suture is taken out and the suspensory worn some time thereafter for support. If the operation is made for some condition other than varicocele the contents of the scrotum can easily be reached after the sheath of the cord has been opened. By taking the scrotum between the thumb and tips of the fingers gentle taxis and upward pressure will cause the testicle to present into or out of the wound as may be desired.

All the arguments used in the reports above quoted for varicocele hold equally good, in my opinion, for any operation on the contents of the scrotum, and I believe that the suprapubic or high operation is destined to supersede the scrotal or low operation in most of these cases.

As the operation for varicocele is so successful and without danger to persons otherwise in good health, I believe that no recruit should be rejected for the services for this defect. Let its nature be explained to him and let him agree to accept operation should it be deemed necessary after he enters the service. Many young men otherwise desirable recruits are lost to the services because of this defect who would undoubtedly accept operation for its correction and no one once in the service should be discharged because of it.

Fort Snelling, Minnesota,
May, 1901.

DISCUSSION.

MAJ. T. C. CLARK, Minn.—I think all surgeons who have had occasion to examine recruits for the regular service in the

late war will agree with me that there was a surprisingly large percentage that had to be rejected. To me, at least, it was a matter of surprise. I remember the case of a young man who was an athlete and a director of athletics by profession, and he was almost heartbroken because he could not go. I told him if he would go to the hospital for treatment he might be able to go if a regiment was formed later. He took my advice and went out with a later regiment. I agree with the plea made by Maj. Bradley that the operation should be made at the government hospital, because it is an operation that is usually successful and there is little danger to the individual from infection, and a man that was otherwise acceptable would make a good recruit. The experiences of surgeons are such that I think the government should revise its requirements and accept a man who was otherwise acceptable and have him operated upon. I remember a number of cases I was obliged to reject for the service that in every other respect would have made first class soldiers, and I think exception should be made in the case of such recruits with the understanding that they be operated upon and have it done immediately. I think the result would be the acceptance of a great many good men now rejected on that score. I believe this is a very practical matter for this Association to take up.

LIEUT. COL. J. D. GRIFFITH, Mo.—The operative interference we have had so fully described in this complete paper is a subject of great importance, and I think we should certainly discuss the question as to whether a soldier with an ordinary varicocele should be refused admission to the army. As to the operation above the pubis, I do not think it is as yet a settled one. Some reasons why it is not yet generally accepted are these: Whenever you destroy or open up one of the cavities of the inguinal canal you have to sew it together again, and remember you weaken the walls of the abdomen where you already have a weak place. It is a question whether or not it is not better to run the risk of not being able to completely sterilize the skin of the scrotum and take the chances with the catgut for ligation. For years I have ligated the veins just below the external ring, and ligated them further down, one and one-half to two inches, leaving one piece of the string and then laying them together and making with the catgut a suspensory, an automatic suspensory with the cord itself. Ligating and sewing this together with subcutaneous stitches we had no trouble whatever with this method. I think it is to a very great extent due to the cleanliness first of your patient, and then the cleanliness of

the cut and of the scrotum itself. Of course, you can clean the scrotum in a few hours, I admit that; but if you prepare it forty-eight hours before operation, shave it thoroughly, wash it well with soap and have it well sterilized I do not see any reason why you cannot get as good a result as you can by the other operation and you do not weaken the walls of the abdomen.

COL. E. W. LEE, Neb.—I feel justified in emphasizing in a degree the remarks of Col. Griffith, and especially in this respect that I believe there has been altogether too much pathological importance attributed to varicocele. I believe that if all the gentlemen present would submit to an examination by a man who was very strict in his examination he would condemn ninety-nine per cent of them as victims of varicocele. I think there has been altogether too much importance attributed to its pathological conditions and to its effects. I will admit that I have performed the operation for the radical cure of varicocele a number of times when it was at the solicitation and importunities of patients who had been led to believe they were suffering from a certain incurable disease from accounts they had seen somewhere in medical advertisements. These simple conditions have been so impressed upon the minds of a great many individuals that they suffer a great many inconveniences and perturbations of mind and body from a cause that really does not exist. They see advertised in the papers a sure cure for varicocele, hydrocele and all that sort of thing to the extent that they go to the physician and implore his aid, and often as a relief for the mental suffering the surgeon is persuaded to perform an operation. The operation that I was first taught to do and the operation I did do was to remove all the redundant scrotum, shortening the long scrotum and thereby producing a natural support, making a natural suspensory bandage, and we all know that varicocele in a great many cases passes away and subsides by wearing a suspensory bandage. The operation I first performed was the removal of the redundant scrotum, making a natural suspensory bandage which took the strain off the vessels of the cord and consequently relieved the extension, and in due time the varicocele subsided to a great extent. The operation I have performed in recent years is the scrotal operation. It is a simple incision in the scrotum and the removal of the dilated vessels of the pampiniform plexus, being careful not to include the vas deferens and veins of the cord. I prefer this to the high suprapubic operation simply because I believe to a certain extent the suprapubic operation weakens what we term the ingui-

nal tract or the inguinal canal. There is only one objection to the operation on the scrotum, and that is that invariably we can get a better union above Poupart's ligament than we can in the scrotum but we can get a perfect union in the scrotum if we are careful of the manner in which we apply our sutures and the manner in which we bring our tissues into contact. If we are careful to bring our tissues into perfect contact we can get an absolutely perfect union. The natural tendency of scrotal tissue is to contract, but if care is taken the scrotal tissue can be brought into apposition and united and held there if the proper suture is applied, and the suture I have used is very close, an interrupted suture. If we give it a continuous suture we are liable to corrugate it, liable to mangle it, but I believe the proper suture is the interrupted suture placed very near together.

BRIG. GEN. F. W. BYERS, Wis.—I do not propose to take up the question of operation for varicocele, but I wish to state here that I believe varicocele should be a bar to enlistment in the volunteer service. From an experience of thirty years as an examining surgeon I will state to the gentlemen that they have no idea how many applications for pensions there are for some disability always and invariably claimed as the result of varicocele; and I think in the examination for enlistment in the national guards of the various states, and for enlistment in the volunteer service no one should be permitted to serve as a volunteer or member of the national guard who has any complication of that character. You will bear me out in the statement in your own experience that the enlisted man in the volunteer service if he has a trouble of this kind always has a standing excuse when he has a disagreeable duty to perform, and when he tells his Captain or surgeon that he has varicocele he is excused from the most important duty that the enlisted man is required to do, and I would suggest to the gentlemen of this organization, both in the volunteer and the national guard service, that whenever a man comes up for enlistment that has any disability of that character reject him. In the pension department today there is scarcely an examination made in any part of the country but some fellow comes up with some claim for varicocele or disease of the scrotum, and I would suggest, gentlemen, that although a man may be physically perfect in every other respect, if there is any sort of hernial or scrotal trouble set the man aside and tell him he is not going to be accepted.

COL. R. HARVEY REED, Wyo.—The question that has been

so ably discussed by Major Bradley is one of very great importance, as we all know the frequency of varicocele, and I agree with Dr. Lee that a great deal of this is a mere figment of the imagination, in some people at least, but I also agree with General Byers that it should be a bar to enlistment in the army. If a man with varicocele is going to be admitted let him be operated upon before we take him, for if we take him he is liable afterwards to claim a pension for disability on that account.

As to the operation for varicocele, I do not think it is any more frequent in my section of the country than in others, but I am placed in a position where I make a great many operations for varicocele every year, and I feel, while the paper is a valuable one, I cannot consent to the idea of the suprapubic operation being the superior one. I know no reason why the scrotum cannot be cleansed as well as any other part of the body, and as for the operation, I saw way back in years gone by an operation made by old Dr. Craig who ligated the veins with a hemp ligature. I have seen many operations and I do not advise the subcutaneous at all, but I think the simple operation of cutting into the side of the scrotum and excising these varicose veins is as good an operation as I want. It was stated by the essayist that we had no atrophy of the testicle with the suprapubic operation. I do not see any reason why we should not have it with one operation as well as another. If I exclude the artery, the vas deferens, I cannot understand that we will have trouble, and I have made several operations with other surgeons and made that operation and found where the artery was properly excluded the results were better than if done by the suprapubic operation. I do not see that that argument stands in the way at all. I do not expect a patient to stay in the hospital to exceed ten days. A week to ten days is the usual time the patient is in the hospital when I operate for varicocele, and it is the exception to the rule when a case goes over ten days. In that time I usually have the patient discharged and healing by first intention. It is a simple operation, simply to cut into the skin and ligate with an aseptic ligature. I use a catgut that has recently been brought out by Dr. Boeckman of this city, and who recently wrote me that he believed it to be anti-pyogenic. I prefer to use that and have no trouble with the operation. There is no danger. I have had no case during the last four years of atrophy and no trouble with the testicle whatever. I do say if we are going to admit soldiers with varicocele operate first.

LIEUT. R. K. HUTCHINGS, Colo.—In regard to the statement made concerning the claims that appear before the pension board on account of this trouble, I am examiner of the pension board at Colorado Springs, and yet I have to find the man that has a disability from varicocele. Most all of them claim to have, but we examine them and we find there is no real disability from it.

In regard to the operation, I prefer to operate through the scrotum. I never tried the suprapubic, but I find the scrotal method eminently satisfactory, and why an otherwise strong and healthy man should be kept out of the service is a reason that looks to me uncalled for. Now it is true, as our friend Gen. Byers says, that they will make such claims, but it looks to me as though in the service the responsibility lies with the doctor. Why do we have medical examiners? Why do we have surgeons in the service? They are the ones to tell the men in power whether these men applying for admission to the army are disabled or not. It is really catering to the quacks. They advertise all these things and they get men to believe they are troubled with this disease and many other diseases which have no bearing on their health. If a man claims he has varicocele and is disabled, the thing to do is to turn him over to the regimental surgeon; that settles the matter. If he is the right kind of a man, which we know he is, he will tell whether that man is disabled or not disabled. It is "up to" the doctor. But I have yet to find the man applying for a pension from varicocele that is really disabled from that and that alone.

COL. W. W. GRANT, Colo.—There is another feature in this matter of varicocele and diseases of that nature. I have found in cases of chronic hemorrhoids a marked mental depression present in many cases. It unfits a man for the life of an ordinary soldier or civilian. I have found him suffering greatly mentally when all that was the matter with him was varicocele. My operation, it seems to me, is a logical one, and it is the suprapubic instead of the scrotal. I do not fear to cut in on account of any danger because it is a simple operation. I have no trouble in cutting above the pubis. All that is necessary is to excise the veins and bring them together and shorten the scrotum, and in a few months the patient will be well. There can be no objection to this and there is no danger of infection.

LIEUT. COL. JOHN VAN. R. HOFF, U. S. A.—One day in a clinic given by Dr. McBurney of New York, he presented a case

of radical cure for varicocele. He said the young man was a candidate for admission to the military academy and the military academy demanded that no man be admitted to the academy or to the army who had varicocele of any importance. Maj. Bradley has also quoted the requirements of the army that no man should be passed who had varicocele of any importance. Whether or not there ever has been a case of disability due to varicocele, of course, you gentlemen are quite as competent to say as I am. I know from my own experience in the service that there are a great many men who have claimed to be disabled by reason of that disease. I know a great many that have been passed with varicocele who said at the time of examination they did not know they had varicocele, who were taken into the service, and in four weeks they did not report on account of varicocele. Who can say whether or not those men lied. The gentleman from Colorado said it was "up to the doctor." It *is* "up to the doctor." Can he say these men are diseased? I believe we have to take the safe side. We are certain as the day follows night that there will come a time, even if that man has gone through the service and made a good record, when he will appear as an applicant for a pension. One of the most important duties the medical officer has to perform today is to protect the United States treasury.

MAJOR T. C. CLARK, Minn.—I want to raise the point that as long as the requirements are as strict as laid down in the Manual, and as long as this warlike spirit continues, you will find thousands of men troubled with varicocele, and you will find thousands of men not barred out; the surgeon will put down in the examination paper that the man has varicocele, but the man is needed and the disease is not of much importance and it will not keep him out of the service. But so long as it does not exclude men from volunteer service you will find examining surgeons passing these men. As my colleagues said to me, they considered it of minor importance, but you will find thousands of men enrolled who will afterwards apply for a pension. It is a rule that cannot be enforced. It is better to have the state exclude him for varicocele than to have him appear a few months later as an applicant for a pension on account of varicocele. I think Col. Hoff will agree with me that no government in the world has such strict requirements as the United States. Where would Germany get her soldiers if her requirements were as strict as ours? and you will admit that Germany has good soldiers. Men are permitted to lay a foundation for pension

claims afterwards by the disinclination of the examining surgeon to exclude them for a disability he considers of minor importance.

MAJ. GEO. HALLEY, Mo.—I think there is but little doubt (there is none in my mind, at least) that every man with varicocele is physiologically not a perfect individual. His imperfection consists in the structure of his veins. Every individual suffering with varicocele has vessels that will not bear ordinary tension, therefore I take it that pathologically and physiologically he is an imperfect individual and should not be accepted. With reference to the operation, the suprapubic is the only operation I have ever done. I never tie without cutting down to see what I am tying. I was always afraid of the other. I do not hold that there is no man on the face of the earth who can take up all those arteries without making that incision. I have been doing this operation for twenty-five years, and I have a record of some sixty-seven or sixty-eight that I have done. I used to do the operation by incising through the upper part of the scrotum, but for the last ten years I have invariably made the incision above the pubes, because I can get at it better and tie the veins easier. One point that has not been mentioned, and one of the difficulties I have encountered in high operations and to which I now pay very careful attention, is to very securely tie the lower end of the veins. At first I used to ligate the veins continuously and not cut them off, but I found in a good many cases the condition returned. I get them out now, separate the veins at the lower end toward the testicle and tie them securely, and as long as the catgut holds you will have no hemorrhage. The ligation above is a very minor matter and can be any kind of a cord around there. Of course, it has to be done in a thoroughly aseptic manner as described. Those are about the only points of importance. I never had but one case in which there was any difficulty with the vein, and then I accidentally pulled up the spermatic artery, and then, of course, I castrated right away. I ligated the artery and found I had cut it. It was a very bad case of enormous vessels, and I do not think the testicle was of any great use to the man because it was almost completely absorbed.

With reference to the size, I think the size of the varicocele should cut no figure in the acceptance or rejection of a man. You might as well say that a man with one or two nodules on his leg or small varicose veins should not be ac-

cepted. The pathological conditions will develop as soon as a strain is put on the veins.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I have had a great deal of experience during the past fourteen years in the examination of life-saving service recruits who are exposed to a great deal of strain. Men who enter that service must be absolutely physically perfect, otherwise under strain, excitement, storm and water in the pursuance of their work they could not stand the strain; therefore they must be physically perfect. I have examined a good many men who have had varicocele. The experience that I have had has taught me that ordinarily varicocele does not interfere with a man's work. I think we may assume that a man with varicocele is normal. I do not know what the percentage of varicocele is, but a slight varicocele exists in at least seventy-five per cent of men, and it has been my individual practice to pass men with slight varicocele, noting that fact on their examination papers. I only mention this fact as a contribution to the general consensus of opinion in regard to the matter. Doubtless the fact may be of interest, because life saving men are subjected to a continuous strain for many hours. It is the duty of the examining surgeon to ascertain whether the man can stand that strain for any length of time. It has been the custom in the marine hospital service to reject men with a hernia because I believe that some moment when under severe strain he might give way, but for varicocele it has been my individual custom and the custom of the service unless it was very large, to pass the man. I believe you will find that varicocele is a normal condition in nine-tenths of the individuals that are brought under examination.

BRIG. GEN. JAMES T. PRIESTLEY, Ia.—The point the writer wishes to make is that the suprapubic operation can be performed as well as the scrotal. He is doubtless right. I have never done the suprapubic operation until of late years. I have made many through the scrotum, tying off the veins and shortening the scrotum. Whenever I have operated for hernia and found a varicocele I have tied off the veins through the hernial incision. My percentage of complete suprapubic operations is much better than the scrotal. I have had infection through the scrotum, but never through a good, clean suprapubic operation.

DR. CHRISTIAN FENGER, Illinois.—Whether this is a normal condition is a question that comes to my mind. In the hospital we do not see many old men with varicocele;

it is a condition that usually disappears in middle life, and that would speak against its being a disease of a progressive character as many other diseases are. In our clinics there are a good many patients with varicocele that we send away and tell them that it is unnecessary to operate upon them. They have been scared by quacks and pamphlets sent out by such people, but we tell them they must be patient and that there is no cause for alarm. As far as the military service is concerned I have no experience in that direction.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—That is my experience. Varicocele does not progress. At this point I would like to say that varicocele in men between twenty-five and thirty does not progress, therefore you can count its limit. I believe I have Dr. Fenger's word for that.

MAJ. ALFRED E. BRADLEY, U. S. A.—My object in presenting the paper was to show that to my mind at least, the suprapubic operation was the safer operation. I have done both the scrotal and the suprapubic. It was brought out in the discussion that it would weaken the abdominal wall. The incision I make is well down towards the base of the penis in the external abdominal ring, and I find it does not weaken the wall in any way. The incision is a small one, usually an inch is sufficient. The reason the circular I referred to was published by the Surgeon General of the Army was because so many cases were coming in requesting discharge for disability on account of varicocele, and the ground was taken that it was not a disability for which discharge should be given, that they were proper cases for operation and restoration to duty. I think Dr. Wertenbaker mentioned that he concluded that nine-tenths of the men were troubled with varicocele and therefore considered it a pathological condition. During the war Dr. Senn was on duty at Springfield, and there he examined 9815 recruits for the volunteer service. He took exceptional pains to investigate varicocele. He was surprised at the prevalence of the affection. He classified them as small, medium and large varicocele. The disease was more frequent in robust men than in slightly built men. Atrophy of the testicle was seldom noted. He goes on to show that of the 9815 recruits 2078 were affected with varicocele, or 21.17 per cent.

COL. EDWARD W. LEE, Neb.—Those 21 per cent were not excluded on account of that condition?

MAJ. A. E. BRADLEY, U. S. A.—I think it was attempted simply to show the number that had varicocele; not those that were rejected.



OBSERVATIONS IN CHINA AND THE TROPICS ON THE ARMY RATION AND THE POST EXCHANGE OR CANTEEN.

By MAJOR LOUIS LIVINGSTON SEAMAN, M. D., L L. B.

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UNITED STATES Military Hospital No. 1 at Camp Reilly, Peking, occupies one of the many compounds of the Temple of Agriculture, one of the most sacred and classic spots in the Celestial Empire. It is here that the "Son of Heaven", attended by high religious functionaries, comes annually in great pomp and splendor, on the Chinese New Year (corresponding with our 19th of February) to break the soil with his own hands, and to pray to the gods of air and water, that sunshine and rain may bring bounteous crops to his land, and that prosperity and happiness may thereby come to his people. For reasons unnecessary to mention, for the first time in centuries, this beautiful and poetical ceremony, was this year omitted. Occidental ideas in the way of punitive expeditions, revenge, lootings, ravishings, pillagings, the torch, drowning by thousands (twelve thousand innocents in one day driven into the Amur River at Blagoveshinski), being some of the methods now in vogue, for impressing a "higher civilization" on this unhappy land. But, as Kipling might say, "this is another story", only, it may be added with patriotic pride, General Chaffee and the American forces were not participants in these acts of vandalism. They never forgot the laws of honorable warfare, and no deed can be attributed to them, that will tarnish the bright escutcheon of this great Republic.

There is but one style of architecture in China, and its type never becomes monotonous because it is so artistically perfect. The larger temples, notably those in the Forbidden City, the Ming Tombs, and those in the Compounds of "Ag-

ments of our Army, that two tons of the surplus water was donated by the hospital department to the Japanese Army every day of the winter. The American Quartermaster (Major Byron) also cut and stored 800 tons of ice in Peking, at a cost of 1250 Mexican dollars. It was the only ice ever housed in that ancient city, and curious bodies of natives used to gather around the camp to watch the novel work of the "foreign devils" and coolies.

It was indeed most gratifying, after spending a fair share of time during the past three years in the Military Hospitals of Porto Rico, Cuba and the Philipines, where a vast majority of the patients were suffering from preventable diseases—diseases resulting from blunders and ignorance—to make a tour through the wards at Camp Reilly, and to note the distinctly different types of cases. The low percentage of all illnesses, except venereal, and especially the almost total absence of the class termed "digestive diseases" offer a startling contrast to conditions existing during the Spanish-American War in Porto Rico or Cuba. There I have seen as high as 75 per cent. of a command suffering from these diseases at one time. Or in the Philipines, where despite the constant depletion of the wards by death, or hospital ships, or U. S. Army transports, carrying from a hundred to five hundred invalided or convalescent men home per month, the percentage of these cases remains persistently high. One naturally looks sharply for the cause of this startling difference, a difference from $\frac{1}{200}$ of 1 per cent, to 75 per cent. A glance at the men at their mess and a consideration of their environment discloses the secret. What appetites—what digestions! You would not believe these men were the emaciated sallow-cheeked troops who came as the American Army from the Philipines last summer. But they are. Here in this invigorating zero temperature, where animal heat is rapidly radiated and where nutritious foods, rich in fats and carbon, are requisite to maintain the body's temperature, the men show evidences of splendid health. It is not my purpose in the limited scope of this paper to review the merits of different foods, more than to

briefly call attention to the dietetic value of sugar as a producer of energy, or the elaborate experiments of Mosso, who with the ergostat, demonstrated that much less muscular deterioration occurred under a sugar diet; and that when muscles were fatigued and incapable of further work, sugar, a pure carbohydrate, most quickly restored their tone; nor even to recall the elaborate tables of Ranke who long ago demonstrated that four-fifths of the food consumed by the average laborer goes to the production of animal heat. In China, heat-producing foods were needed. Even our full Army ration, the richest and most varied in the world, and the envy of every soldier of the allied armies in China, was not found sufficient to satisfy the cravings of the men. Repeatedly, officers have told me their "company funds" were largely depleted by the constant demands of the men for extra allowances. Their appetites were enormous, their food was digested, assimilated and metabolized. The energy of their systems was not consumed in an effort to eliminate these heat-producing foods, as was the case when they were in the tropics where they lived in an environment of heat, and where such foods were superfluous or inappropriate, and therefore were not digested or metabolized. Under these conditions such foods rapidly undergo decomposition in the intestinal tract and create toxines, which Nature endeavors to eliminate as quickly as possible by establishing catarrhs and diarrhoea, as the only method left to rid herself of such irritants.

And yet Congress has just decreed that no change shall be made in the U. S. Army Ration—that it shall remain practically the same at the Pole as at the Equator. Fortunate indeed it is, that the soldier has learned, even though by bitter experience, that this is insanity. He sells his "sow-belly" and "salt-horse" when opportunity offers, and buys in exchange chicken or rice or fish or fruits and sweets, which are usually to be had in abundance in the Tropics. The advocate of the present regime interrupts with: "He could always sell or commute his ration." Yes, provided he always had a market with him on his "hikes", but those who have served with him

in a hostile country, or on the firing line, where he most needs a proper diet, know much better. The impartial and scientific observer sees in this answer only the bureaucrat's subterfuge, dictated by a spirit of ignorance or obstinacy, and resistance to change from established routine, and a lack of courage to shoulder responsibility for fatal blunders that have long crowded our tropic hospitals and made the mournful notes of "taps" so familiar in the land. Let it not be forgotten that in the Spanish-American War, the actual hostilities of which lasted for only six weeks, there were fifteen fatalities from disease (practically all preventable) for one from bullets and wounds. With the passing of Algerism and Eganism it is hoped that some improvement might follow, but it seems we are still doomed to delay.

If any vindication were necessary for the theory for regulating the ration of an army to suit climatic conditions, unanswerable proof can be found in Peking, in the study of the statistics of every company serving in the Chinese Expedition. At my earnest solicitation Captain Anderson commanding Company A, Ninth U. S. Infantry obtained the following figures for me. His command, now numbering 85, came from Manila to China with the first American troops landing at Taku last June. At that time 29, or 33 per cent., of the men were suffering from chronic diarrhoea contracted in the Philippines. On their arrival in China the combined weight of the Company was 12304 pounds. (I have the individual figures). On February the 15th, 1901, these same men weighed 13284 or an average gain of about $13\frac{1}{2}$ pounds. There was not a case of so-called "digestive disease" in the Company nor a man in the hospital. On the contrary, to illustrate the state of the men's digestive ability, the Captain adds:

"During the month of January, 1901, the following extra commissary supplies were used by my Company:

- 3 bbls. (78 gals) pickles.
- 240 cans cream.
- 240 lbs. oatmeal.
- 75 lbs. maccaroni.

60 lbs. cheese.
 75 lbs. onions.
 12 lbs. baking powder.
 2 gals. syrup.
 117 rations of bread.
 127 lbs. beef.

Total cost of extra \$93.30 and paid from the Company Fund."

The reason for this remarkable difference lies in the changed climatic conditions, the extreme winter temperature of Peking being fully 100° F. lower than that of Manila; in Peking this rich ration is requisite for the proper nourishment of the system.

As further bearing upon this point, let me submit the testimony of a witness, our American Consul at Formosa, whose opportunities for personal observation on this most important subject have rarely if ever been surpassed. His letter is better reading than medical statistics.

"DEAR MAJOR SEAMAN:

"I have perused your very interesting pamphlet on the Army Ration, and the following personal observations may be of some interest to you. As you are aware, I have had rather an unusual opportunity of confirming your statements on the subject of diet. The years 1893 and 1894, as a member of the Peary Arctic Expedition, were spent in North Greenland, within the Arctic Circle. On returning from this trip, I departed almost immediately for Formosa, which is within the tropics, and called the most deadly climate in Asia, and the last six years have been spent in this island.

"In North Greenland our supplies were naturally limited to most portable foods, delicacies were left at home and we did not always have as much in quantity as we wished. It is not strange, therefore, that we, as young men, sometimes turned from our dry pemmican and biscuits, to discuss the probable joys, from a culinary standpoint, awaiting us on our return to the States. You will doubtless surmise that oyster stews, roast turkeys, or pies "like mother used to make" were the subject of our discussion. These we could give warm welcome, still they were far from that glorious dish for which

we all yearned and I might say, almost prayed—it was nothing more than a *side of bacon*. Not the streaky article marked “prime,” but the kind that is practically solid fat, and which the butcher in the temperate zone usually throws in the lard pot. We wished no side dishes, and even the cooking did not worry us much; in fact, I believe we would have preferred it merely warmed. On an occasional trip to the southern headquarters we were sometimes the recipients of a thin slice or so dealt out from our slender stock. And how good it was! There was nothing that could approach it. On one occasion I was fortunate, at least I looked upon it in that light then, to obtain out of meal hours from the cook the outer skin or end piece of a side of bacon. I immediately sought the seclusion of my room, warmed it slightly over the flame of my candle, and then ate it with all the pleasure that a young boy obtains from his favorite confectionery.

“Before our return from Greenland, I arranged with my room-mate, that on our arrival at St. Johns, the first port on our downward journey, we should go together to the leading grocery, which we had visited on our upward journey, and purchase a side of bacon. This we would take quietly to the hotel, and for once have simply all the bacon we wished. Of course on our actual arrival at St. Johns, the subject of bacon never entered our heads. We had entered the temperate zone, our systems ceased to call for fat, and we were prepared to give warm welcome to dishes of quite a different nature. This appetite for fat and fatty meats so keen in the far North, is merely Nature’s call for help in repelling the almost overpowering cold, and if it is answered there is but little fear of disease. There is probably not a healthier race on earth than the Eskimo of these regions, and our party suffered not the slightest indisposition while there. Yet the same diet in the tropics would be absolutely fatal.

“In tropical Formosa, the idea of fat bacon was as repulsive as it was entrancing in the North. There, did I think of home delicacies, it was the splendid fruits, the strawberries, the luscious peaches that interested me. Nature had given me new tastes, new fancies, an appetite for something that would induce energy, without heat. If we were wise and obeyed her and left aside intoxicants and heavy fatty meats, we found our life a pleasant and not unhealthy one. And, although Formosa has the reputation of being the unhealthiest spot in Asia, I am convinced from my own experience of six years that one who is careful in one’s diet, selecting only the foods

which will tend to assist Nature rather than oppose it, will find life quite as healthy in Formosa as they will out of it, assuming of course, that they live in suitable quarters raised above the ground, and protect themselves against the mid-day sun when in the open.

In 1892, on my departure for Greenland, I weighed one hundred and forty-eight pounds, after six weeks of Arctic life on a suitable diet my weight increased to one hundred and ninety pounds. During several months' confinement with a frozen foot I lost heavily, and on my arrival in Formosa in 1894, weighed one hundred and fifty-five pounds. After a six years stay in the island during which I had not had a single sick day, I am now returning to my home land weighing one hundred and ninety-four pounds. The practical diet for a tropical country should, as you suggest, be light meats, chicken, fish, fruits, sugar, tea and rice which are to be found there in abundance. This is what I lived upon. During the two years I was attached to the Imperial Japanese Army, in its campaign against the Chinese rebels in the island, I suffered as severe physical hardships as the average soldier finds in any military campaign in the Tropics. By carefully obeying the dictates of Nature in the selection of foods, I have not—either in Greenland or Formosa suffered, *a single day from sickness.*

“Yours truly,

[Signed] “JAMES W. DAVIDSON, F.R.G.S.

“U. S. Consul for Formosa.

“Yokohama, Japan, March 21st, 1901.”

Could any testimony be more convincing? But of what value is the *best* evidence before a court of Congress that would sell its birthright for a mess of pottage, as was done by the last one, in its servile catering for votes, by submitting, against its judgment, to the influence of a lot of fanatical and hysterical women, and abolishing the Army Post Exchange or “Canteen.” As you well know, the overwhelming testimony of line and staff officers, men of probity and honor, total abstainers and others, was almost to a man, in favor of the retention of the Post Exchange. It is not my purpose to review the evidence on this subject that was pretty thoroughly threshed during the debate in Congress, but there was one very important factor that was entirely omitted in that discussion, that may furnish a subject for reflection for those who were instrumental in bringing about this lamentable

change. The enemies of the canteen seem to have forgotten that when men accustomed to the use of stimulants are deprived of them, in one way, they will resort to other methods to obtain them. Less than five per cent. of the Army are total abstainers. Soldiers are not prisoners; they are well-paid men and have their pass days. The habits of the vast majority of them were formed long before their enlistment and a large proportion of them belong to the class known as light drinkers. When the soldier cannot obtain a glass of beer or light wine at the Post Exchange in camp, the first place he generally strikes for when on pass is the nearest saloon, where in Porto Rico he is served with rum loaded with fusil oil—at home, vile doctored whiskey—in the Philippines,—vino—a sort of wood alcohol, distilled from the nepa leaf—or in China, the samshu, a product of rice,—all rank poisons, one or two drinks of which “steals away his brains”. Then follows excesses to which in his sober moments he would be the last to descend, insubordination, drunkenness, debauchery, or desertion.

The record of the summary Court of the 12th U. S. Infantry shows that during February and March, 1900, at Paniqui, P. I. there were between 70 and 90 trials by Court Martial for each month. Four-fifths of the offenses were “intoxication from native vino.” A Post Exchange was established in the latter part of March. Since then and until February 1901, there were never more than twenty trials in any month, and one month the number was reduced to eight. The Record shows no more than two cases of “vino intoxication” in any month. The Company Commander’s report shows there are but eight total abstainers in the Regiment.

In reviewing the report of vital statistics at Camp Reilly, you must have observed the high per centage of the venereal diseases, over 50 per cent. of all patients under treatment being for this cause. It is to this distressing factor, in connection with the subject of the Canteen, that your attention is specially invited. Venereal disease always claims a large proportion of patients in a Military hospital, but I have it on the

authority of Lieut. Greenleaf and his assistant Dr. Lewis, than whom I have met no more conscientious officers in the Medical Department of the American Army, that, since the abolition of the Canteen, the percentage of these cases has almost *doubled*. My own observations in other Military Hospitals tend to a similar conclusion. The men get their liquor away from the Post, and leave the rum hole for the brothel. When the canteen was maintained they drank less, were under better influences, and returned, sober and contented, to their library and reading room, or their other quarters. When the misguided enthusiasts of the W. C. T. U. stop to reflect that the result of their influence in inducing Congress to abolish the Post Exchange, has produced this enormous increase of wretchedness in the Army Hospitals, and made many a husband, father or lover the victim of a degrading disease, they may indulge in less self-congratulation, and conclude to cease interfering with institutions about which they are so hopelessly ignorant. The Post Exchange was the most rational compromise that the ripe experience of the ablest officers of the Army could devise,—it was not abused in the camps; it has been the soldier's friend, often saving him from disgrace and disease worse than death. Some years ago the "Exeter Hall crowd" of England, induced Parliament, by methods similar to those used by the W. C. T. U., to abolish the "Contagious Diseases Act" in India, a law that had proved so effective in the elimination of these diseases, that in 1884 they were comparatively unknown in the Army there. Today, owing to its abolition, there is no single cause so prolific in invaliding men home as this one. The Rains Law, another instance of meddling legislation, has been productive in spreading immorality to an extent heretofore unheard of in the greatest metropolis of this country, but there is no necessity of elaborating the subject to a medical audience. If the W. C. T. U. could be induced to direct its energies toward a cooperation with the medical associations of our country, which are now making a study of the social evil, and are endeavoring to bring about its segregation and limitation as far as possible within prop-

er lines, it would *then* accomplish a great reform, and prove itself a *real* benefactor to humanity.

Congress, however, when considering the repeal of the Anti-Canteen Act, as it must at its next session, will do well to remember that the abolition of the Post Exchange has not promoted temperance. On the contrary, it has decidedly promoted intemperance, insubordination, discontent, sullenness, disease and desertion. It has embittered the men, and driven them to the very excesses sought to be abolished. You cannot legislate men to be virtuous or to be total abstainers, but you can, by judicious handling, promote chastity and temperance. The Canteen fostered moderation. It led the hard drinker to less indulgence and removed the temptation which always clings to forbidden fruit. Its abolition angered the men. They felt it as an insult to their manhood, and a deprivation of their natural rights. They *will* drink if they wish, and they resent the attempt to prevent them. A glass or two of beer is not injurious to them, and they know it, and sneeringly criticise Congressmen—paid servants of the Government—who retain their well patronized cloak room with its private stock of good old whiskey, but who rob the soldiers—other paid servants of the same Government—of their right to take a glass of beer on their camp grounds, in their well-disciplined and orderly Canteens. And who will gainsay the justice of this conclusion?

DISCUSSION.

MAJOR LOUIS L. SEAMAN, U. S. V. E.—To bring this matter to a head, I present the following resolution:

WHEREAS, The Association of Military Surgeons of the United States, now in session at St. Paul, recognizes that the abolition of the Army Post Exchange or Canteen has resulted, and must inevitably result, in an increase of intemperance, insubordination, discontent, desertion and disease in the Army, Therefore, be it

RESOLVED, That this body deplores the action of Congress in abolishing the said Post Exchange or Canteen, and, in the interests of sanitation, morality and discipline, recommends its re-establishment at the earliest possible date.¹

¹ For further discussion upon this resolution, and additional sections, see page 54.

COL. W. W. GRANT, Colo.—I hope everybody will discuss this paper. I do not think this Association should adjourn without passing a resolution asking congress to repeal its recent act abolishing the canteen. I was in conversation recently with Gen. Lee of Denver, who as a medical man and an army officer has had a wide experience, and he denounced this act in unmeasured terms and said Congress would have to repeal it. He is in a position to speak authoritatively in reference to this matter. Of course the influence that operated upon it we all understand. Congressmen do not expect to receive as much support from medical men as they do from others. If medical men would agitate this matter, if they were determined and united in their demands on their congressmen they could accomplish for themselves and the welfare of the country and the sanitary conditions of the army much more than they have yet accomplished.

COL. R. H. REED, Wyo.—This paper is the most admirable I have ever heard upon this subject. It brings up a question of vital importance to our soldiers and one that this body should discuss freely and thoroughly. It is unfortunate that we have a class of people in this country who are theorists. The class represented by the W. C. T. U. are doing a good work in their sphere, but they have no business to meddle with things that do not belong to them; they have gotten out of their sphere, and have meddled in the laws of the United States in doing so. During the past session of congress they have induced the members to pass this law, which, instead of accomplishing what they desired, has accomplished the very opposite. It is very evident that this body will have to act, if it desires to accomplish the repeal of this law, and for that reason I am heartily in favor of the resolution offered. I hope we will not only pass the resolution, but I hope a copy of the resolution and paper will be sent to every congressman and senator.

BRIG. GEN F. W. BYERS, Wis.—I am interested probably no more and no less than any other citizen of the United States or old soldier in this canteen question. I have seen something of it in the volunteer service, and being connected with the post tradership years ago I think and believe the greatest mistake that has been made in late years has been this cursed meddling with the army by outsiders not connected with it. Under the old method of conducting the canteen or post exchange as it is called now, the soldier took control, and it was within the province of every post to say what should or should not be sold; the post controlled this matter. I need not go on

at length to speak about the matter, but there has been a mistake about it. The good women meant to do some good, but they went after it in the wrong way, and I think however much a congressman may want to do his duty he usually counts the votes behind every measure that comes up. Now if we can give those people at Washington to understand that this Association of Military Surgeons controls more votes than the W. C. T. U. we can do something, (applause) otherwise the matter will stay where it is. I do not like politics in the army, I do not like politics in anything military, but there is politics in this, and we have got to give the authorities at Washington to understand that we have votes behind us as well as the W. C. T. U. (Applause).

COL. W. W. GRANT, Colo.—I would just like a word or two to finish my remarks. I do not think it is worth while to say that women should not take an interest in this matter. They have the welfare of the army and the best citizenship at heart. I think the underlying principles of the W. C. T. U. are based on the very best motives, and if we can convince them—[GEN. BYERS: You can't do it; I live with one of them.] [Laughter.] I do believe if that organization is approached properly, and there is no organization in the country that public men and women respect more, they can be convinced that a mistake has been made; and by united action we can show public men and public officials that we have influence.

There is another matter worthy of our consideration, and that is the change in diet. Who is responsible for the fact that the diet is not changed to suit the soldier in a tropical or temperate climate? Is it the surgeon general or congress? Are the public officials who have direct charge of this matter or the commissary general the better informed? There is a medical responsibility in this matter, and if medical men in authority, as in our positions we are, would impress their information in this respect on public men and bodies, we could effect a change in the diet which now means sickness and unfits the men in every way for the duties of a soldier. This is true in reference to the canteen. The canteen can be abused; too much alcohol in such a climate it is well known is an evil, and yet total abstinence under certain conditions and circumstances is a greater evil. The moderate use of alcohol by the soldier is known to be a good thing, and we should use our influence for whatever may benefit and tend to the welfare of the people in whom we are especially interested.

LIEUT. COL. J. D. GRIFFITH, Mo.—Let me say as I have said before, had it not been for the canteen no one knows how many

typhoid cases we would have had at Chickamauga. Of the 38,000 troops gathered there, and I think Col. Hoff will substantiate the statement, eleven and one-half per cent had typhoid fever, and the canteen helped us in fully seven per cent. We only lost a very small percentage, less than they do in any city in the union, but the canteen helped us out. The soldier could get his beer; you did not find him drunk. It was very rarely we had a court martial. Let me say right here that the resolutions of Major Seaman are right to the point, and if this Association can only convince congress that it has taken a wrong step in that direction it means everything to our army. Not only to the regular army, but to the volunteer, and let me say right here that the volunteer in the United States today is the bulwark of the government. The United States army may number 100,000 men, and if it is necessary it can be increased by volunteer service to ten millions in sixty days. When this thing comes to a test, let me say, Mr. President, the canteen will come again. It is our duty to bring it forward and we must have it. It is a necessity; it may be a necessary evil, but we have them all over the land. We must have the canteen.

MAJ. T. C. CLARK, Minn.—I hope the discussion will be very full on this question. Ours is a very small association, it is true, but it ought to be a very influential one, being composed of military men in active service or in state service. Our numbers will not cut so much figure as the judgment we arrive at and in the discussion we send forth, but our discussion should be dignified and our action unanimous to be effective. Now I would be the last person in the world to question the motive of the women of the W. C. T. U. We all know that the instinct of woman is always on the side of right. We may question her logic, we may accuse her of jumping at conclusions, we may question her wisdom as a legislator, but we must always give her credit for having a high motive and a pure instinct in combatting that which she thinks is wrong. Consequently any action we may take here should be dignified, and we should try to make it as effective in that way as possible, and I think the action of this Association, as embodied in this resolution, forwarded to members of congress and spread broadcast throughout the country, cannot fail to have its effect. The opinion of a body of medical men directly interested in this question should appeal to every thinking person, and if there are any members who hold views contrary to this resolution I hope they will speak them, be-

cause to my mind the sentiment of this Association should be unanimous and it ought to go a great way. My experience has been limited, but such as it was I am convinced the canteen was productive of good order and temperance. When men got away from the restraints and influence of the camp to neighboring towns with their low dives intoxication and unbridled license took the place of moderation and sobriety. I do not think there is any question but what that would be the unanimous sentiment of medical officers throughout the army. It only becomes a question of instinct, of demand of the physical nature that is world wide, the demand for a stimulant in some form or other. In some it takes the form of tea or coffee, in others liquor; it manifests itself in various ways. It must be met in a spirit of fairness, in a spirit which will control and regulate and restrict, but it is not effected by a law on the statute book which is ignored, the consequences of which will produce the result you are trying to avoid. I hope the question will be fully discussed by every member who has the subject at heart and that the conclusions we may arrive at will be unanimous.

MAJ. GEO. HALLEY, Mo.—I think the great mistake that has been made has been the advocacy of total abstinence by legislation; that stand has been a mistaken one, and it is a mistake not with reference to the temperance question alone, but with reference to a very large amount of effort that is made to place on the statute books laws to make morals. They may be all right enough, I have no reason to doubt the wisdom of some of them, but in this particular question dealing with temperance it is unwise, it is fatal, it is absolutely impossible to stop men drinking. They have got into that habit and the best that can be done is to regulate it. That is the recognized principle I think in our sociological relations, and in dealing with this question by congress it would be unwise to impugn the motives of the noble band of women who have been trying and are still trying to improve the morals of the army. Their motives have unquestionably been good, but their methods have been unwise, and I have no doubt but that if we can lay this matter properly before congress—and I would like to have this resolution that Major Seaman read, with a short, concise synopsis of the results of the abolishment of the canteen placed alongside of it, placed in the hands of every congressman that he may read it,—and as I said before, if this matter is properly placed before congress I have little doubt of a favorable result. Perhaps some of you know more about this

than I do, but a large bulk of such matters goes into a congressman's waste basket, but I want to put it in such a way that he will read and recognize the importance of this resolution, and we will get a careful consideration of the question by congress and a repeal of a most obnoxious law which causes a very serious interference with the usefulness of the army. I therefore would ask that Major Seaman embody a short synoptical resume of that portion of his paper in which he tells of the evils following the abolishment of the canteen to be submitted to congress with the resolution. The paper I think is one of the most important we can stop to discuss, because it goes to the very heart of army organization.

MAJ. ALLEN A. WESLEY, Ill.—I desire to state that the opinion of the medical officers of the United States Army is unanimous on this question, that is, if the press reports of Chicago are correct. Major Charles E. Woodruff of the regular service, according to the Chicago press, has stated that all kinds of intoxicating liquors should be allowed in the tropics. This positive statement, elaborated in the press is somewhat responsible I think for the action that the ladies took in Chicago, for the papers elaborated very much and the people talked about it a good deal. I think we ought not only to lay a memorial before congress, but we ought to lay a memorial before each one of our editors as well and get them to talk about the matter and teach the public what we want. The press is the educator of the people, and if the press goes right and says that this Association demands the repeal of this law congress will take notice of it. I think, as has been stated, that we can also enlist on our side the W. C. T. U., and we can do that through the press and individually. I believe the canteen is a very potent factor—as stated by Major Seaman, and as I stated last year before the convention—in keeping the soldier in the camp and in keeping up the *morale* of the camp; in that respect I think it is the most potent factor we have, because if the soldier is in camp he is out of mischief elsewhere and he is under observation by the officer. I think we must all heartily concur in what has been said by Major Seaman in his most admirable paper.

There is one question I would like to ask, and that is with reference to salt. Nothing was said about that in his paper. Sugar, of course, is a very desirable food generally, but is there nothing to be gotten from salt? Is there any difference in the tropical and arctic regions in the use of salt? Is its relation to the soldier as a stimulant or vital agent any differ-

ent? I would like to ask whether Major Seaman can give any information in reference to that.

COL. R. H. REED, Wyo.—I just want to add one word to what has been said in reference to our congressmen. The suggestion made by my friend from Missouri [Major Halley] would not be of much value in this case. Send a paper of this kind to the average congressman and it goes into his waste basket. That is not the plan provided for placing the resolution before them. The idea is to have this paper published and each one of us to reach our own congressman in our own state. In addition to that we should have a committee appointed, the members of which live near Washington, and can easily come in touch with congress, to act in this matter and then with the concerted action by members of this Association in approaching their individual members of congress and senators on the committee which will discuss this matter, it can be prevented from being laid on the shelf, but favorably reported for passage. If this is done I have no doubt of the ultimate result. I would recommend that action of this kind be taken, and that we make a systematic effort to attain the point desired with the least possible encumbrance to the members of the house and senate.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—I quite appreciate the unusual interest this Association takes in the post exchange which we of the regular establishment believe in. At the same time while listening to this discussion I was impressed with the idea that there are one or two points which we have not considered. Perhaps it would be well to look into the cause of the agitation to get rid of the post exchange. How was it brought about? For eight years the post exchange existed without any protest from any one. We in the service recognized its value each year as our experience increased. We knew it was an experiment in the service, but we tried it and proved it and we were contented with the situation until something happened to change all this and interest the women of the country in the moral welfare of the army. What happened? In 1898 war broke out. The army was suddenly expanded from 25,000 to 250,000, and a considerable proportion of the young men of the country entered the service anxious to support the honor of the flag, anxious to do their duty as soldiers, anxious to have the experience that all young men seek. These 250,000 men, raw volunteers, were gathered in camp. The material was there, the foundation was there, the experience was not. Among other things that these regiments organized, and which they or-

ganized on exactly the same principle as they organized themselves,—in the very best way they knew how,—was the regimental post exchange or canteen. I well remember when this was done. I remember the fact that the regulations governing the post exchange under the regular establishment were not a part of the “Blue Book” so called,—the general Regulations of the army, which most of us have in the field,—and the consequence was when these exchanges were organized they were not organized under the rule laid down in the regular establishment except in a general way. How could it be expected to be otherwise? I am not offering this in criticism, but simply in an effort to trace out the peculiar causes of the action of the women of the country against this institution. Many irregularities crept into these exchanges. Much was done that never was intended to be done in the regular establishment.

I heard a conversation between two gentlemen, officers who belonged to a volunteer regiment, who were discussing the post exchange.

“How did you get on last month?”

“We took in \$2000.”

“How did you get that much?”

“We had a regiment next to ours whose colonel would not let his men have a post exchange and we just filled them up with beer.”

“Where did you get it?”

“We made an arrangement with a man down here and he knocked off fifty per cent. on the price.”

“What did you do with the money?”

“I got it all.”

“Did you spend any on the mess?”

“What do I want to spend any on the mess for? I don’t know much about that, I will speak of that by and by.”

Such things occurred during that time through ignorance, not through deliberate intent, but there occurred things that were altogether irregular and which produce a wrong impression upon the 250,000 men in the army, and they went back to their mothers, their wives and their sisters and told them of the things that were going on, and they took it up because they thought it was wrong. That is the reason why the W. C. T. U. took up this agitation; that is the reason they went to congress, and congress was absolutely unable to say no, although congress for the most part was thoroughly convinced that the women were wrong. They could not resist the

influence and the methods behind the W. C. T. U. If I am right in my conclusion it is the Woman's Christian Temperance Union we must convince before we can get them to rescind their action. I believe they can be convinced, not this year, and possibly not next year, but after a sufficient length of time they will realize that they misunderstood the situation, and I believe we can get results through them that perhaps we cannot get through congress. There is no question but that the post exchange has its value. Its value is apparent to us; we know what it means; we know how good it is for our soldiers; we know how they promised temperance,—and I distinguish between temperance and teetotalism. We all know that the soldier is just the same as the citizen except that he wears a uniform. He has the same tastes, the same inclination, the same pulse under the blue as he has in the performance of his daily vocations as a citizen. The only point I have to make, Mr. Chairman, is this: not only must we labor with congress, but we must labor with the Woman's Christian Temperance Union, and right away if we expect to get any results in this matter.

BRIG. GEN. GEO. COOK, N. H.—Something has been said here about combined effort. You that are members of the American Medical Association may recall that they have a committee on national legislation. They have accomplished a good deal of work in that direction and that committee is still in existence. They will have a meeting during the session of the American Medical Association and also at Washington next winter. Among other matters this question of the canteen may come up in reference to the medical department of the army and navy. I want to call your attention to the fact that we ought to work together through the great national organization so we may be strong and have a good influence back of us. I am in favor of the resolution as submitted by Maj. Seaman, and I am also in favor of sending it to every congressman and to every association of the W. C. T. U., whom I believe we should deal with kindly and generously and not call anything they have done by a harder term than to say they were misguided; then we can accomplish something.

I would like to add one word in reply to the remarks of the gentleman from Illinois in quoting Major Woodruff's statement as elaborated by the Chicago press and the Chicago temperance associations. Major Woodruff said in his article on the subject of "Food in the Tropics," that he believed it quite necessary that a certain amount of alcohol should be

used; that it was the universal custom of people in tropical countries to use alcohol; that apparently alcohol was necessary; that apparently also it had no deleterious effects, and that therefore he thought they were justified in its use. Undoubtedly some of the Chicago papers manipulated the statement to forward their own sensational ends, but Major Woodruff's conclusions are certainly justified by experience. I only speak of this with a view to Major Woodruff's position being made clear in the notes of the discussion.



THREE NOTEWORTHY CASES OF BRAIN INJURY.

By GEORGE TULLY VAUGHAN, M. D.,

WASHINGTON, D. C.

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FROM the earliest dawn of medical science injuries of the brain, the seat of life and of intellect, if not the soul, have furnished an interesting field for study. The correct explanation of concussion; the mechanism by which laceration and hemorrhage take place without fracture; the laws which govern the direction of the lines of fracture; the prognosis as to life and health and intellect; and the best methods of treatment—are problems which have attracted the attention of surgeons and physicians from the days of Hippocrates and are still burning questions for consideration by the surgeons of our day.

The dangers in cerebral injuries are : shock, hemorrhage causing compression or anaemia, and infection.

The symptoms of shock occur immediately; those of hemorrhage at the same time or a few hours later, occasionally as much as a week later; and those of infection from two days to a week or even several months or years after an injury, possibly as a result of a second injury which arouses a focus of infection which has long remained dormant.

Shock so often coexists with hemorrhage that in many cases it is impossible to know just how much of the symptoms to attribute to shock and how much to hemorrhage.

The remote effects are : abscess, tumor, epilepsy, insanity, and chronic headache.

The work of a brilliant galaxy of neurologists and surgeons composed of Ferrier, Broca, von Bergmann, Starr, Keen, Victor Horsley, and others, in cerebral localization and operations on the brain, during the last quarter of the century just ended, has established surgery of the brain on a firm basis and has proved that with the exercise of proper judgment, skill, and antiseptic precaution, this dangerous region can be invaded with almost the same impunity as that which follows operations on the abdominal viscera—an impunity that is so nearly the rule that the abdominal cavity has been termed the “playground of the surgeon.”

The large amount of brain tissue which can be destroyed without producing death, and the toleration of the brain of the presence of foreign bodies, are remarkable. Two examples of the latter, selected from many reported cases may be mentioned: Evans reports a case in which a piece of wood one and a quarter inch long and the third of an inch thick, remained in a man's brain, just above the ethmoid bone, for thirty-two years. Forwood reports the case of a soldier who was in good health five months after having been shot in the forehead, the Mauser bullet, as shown by a radiograph, remaining lodged in the posterior part of the brain about the tentorium cerebelli.

According to my experience the greatest mortality occurs in injuries which are caused by falls from a height, striking on the head, such as being thrown by a horse, falling from a building or scaffold or a rapidly moving car, or taking a “header” from a bicycle. Such cases are usually accompanied by extensive fracture of the skull, involving both the base and vertex, with numerous lacerations and hemorrhage in the substance of the brain. Of almost equal fatality are gunshot wounds of the brain; while the injuries resulting from blows upon the head by clubs, hammers, hatchets and stones give the smallest mortality, such cases usually consisting in a limited fracture of the skull with a corresponding lesion in the brain.

The treatment will naturally depend upon the nature of

the injury. Symptoms of compression from hemorrhage, depressed bone or other foreign body, demand operative interference. Gunshot wounds of the brain, unfortunately, in the majority of cases are not benefitted by operation. In the few cases in which the patient survives the shock and the ball can be located by means of the Roentgen Ray in an accessible locality, it should be removed in order to prevent the development of abscess, cyst, tumor, or other dangerous sequel.

The following three cases have been selected from my note-book as worthy of being reported:

CASE 1. *Severe hemorrhage with laceration of the brain, without fracture of the skull or rupture of the dura mater.*

K. M., aged 18 years; white; native of the United States, was admitted to the Emergency Hospital August 10, 1899, having just been struck on the head with a club and knocked down. On being assisted to his feet he walked a short distance, fell again and lapsed into complete unconsciousness.

Examination one hour after the injury. Patient profoundly unconscious; breathing deep, sometimes sighing; both pupils dilated and immobile, the pulse 60 and full; clonic contraction at short intervals of the right arm and leg and sometimes the left arm, with persistent tendency of the face to turn to the left side. A small contused wound of the scalp, not extending to the bone, was observed just above the left ear.

A diagnosis of cerebral hemorrhage was made and the patient was immediately prepared for operation. No anaesthetic was necessary. A large flap of scalp was turned down on the left side of the head but a careful examination failed to detect any fracture of the skull. By means of a trephine and bone forceps a section of the skull 10 centimetres in diameter was removed over the fissure of Rolando, when the dura mater was disclosed, bulging, tense, without pulsation, laceration, or rupture. On incising the dura a large black clot of blood, about the size of an orange, popped out. A freely bleeding artery on the surface of the brain was ligated and the finger was gently passed around the opening beneath the dura, but no further clots were discovered. There was no pulsation in the portion of brain exposed. A grooved dilator was passed into the left lateral ventricle, but nothing was discovered.

The only changes caused by the operation were contraction of the pupils and a diminution in the frequency of the

convulsions, and the patient died about two hours later without becoming conscious. The necropsy revealed numerous small hemorrhages throughout both hemispheres.

This case affords an excellent clinical illustration of the elasticity of the skull in permitting such an extensive injury to the brain without fracture of the skull or rupture to the dura mater, as shown by Felizet's well known experiment of filling the skull with paraffine, then dropping it on the floor from a height when it was found that the paraffine is flattened or indented at the point of impact without fracture of the skull.

CASE 2. *Compound fracture of the frontal, nasal, and ethmoid bones, with depression of almost the entire frontal bone.*

E. M., aged 20 years; native of the United States; white; female; typewriter; was admitted to the Emergency Hospital July 21, 1899.

History.—The patient had been injured in a collision between two "roller coasters," by being struck in the face by some object the nature of which was not certainly known, but it was thought to have been the back of another person's head. Unconsciousness resulted but only lasted for a short time, and on admission to the hospital the patient was perfectly conscious, the nose was bleeding freely and she occasionally vomited black blood, which she had probably swallowed. Both eyes were closed by the swelling. The upper part of the nose and almost the entire frontal bone were depressed to the depth of from one to two centimetres.

The patient was prepared for operation by shaving and disinfecting the scalp and the operation was performed about three hours after the injury. An incision was made from one temple to the other, across the top of the head through the edge of the hair, just behind or above the line of depression, and the anterior flap reflected forward. The line of fracture was then seen to extend from the nasal bones through the left supra-orbital ridge, upward and outward and then across through the frontal bone about $2\frac{1}{2}$ centimetres anterior to the coronal suture to the opposite side of the head; then downward and forward to the right temporal fossa just behind the external angular process of the frontal bone. Two other lines of fracture extended from the principal one, one on either side in a direction backward through the remainder of the frontal, and into the parietal bones, to an unknown distance. The parietal bones were freely moveable but were not displaced. That

portion of the frontal bone included in the line of fracture was depressed and overlapped by the surrounding bone, the depression being most marked at the superior border. The depressed bone was elevated by means of a lever passed down to the nasal eminence between the skull and dura mater, the edges of the fractured bones were carefully adjusted, the scalp united with silkworm gut sutures, without drainage and a dressing applied. The first dressing was made on the 10th day after the operation, when primary union was found to have taken place and the stitches were removed. There was some bleeding from the posterior nares for the first three or four days, but the patient recovered without incident and left the hospital at the end of two weeks.

At this time, one year and ten months after the injury, the patient's condition is as follows:

She is able to attend to her work but has occasional spells, once in two or three months, of a highly nervous character, with mental depression, excitability, headache and insomnia, lasting from two or three days to a week,—possibly the premonitory symptoms of epilepsy or insanity. The physical deformity is not very great; the nose is somewhat broadened at the root and the left frontal eminence is a little less prominent than the right; there is a slight internal squint of the left eye and the patient has lost the sense of smell,—evidently from injury to the olfactory nerves from fracture of the ethmoid bone, or inflammatory thickening of the dura mater. A remarkable feature of this case was the extensive fracture of the skull, including both the base and vault but especially the latter, with comparatively little damage to the brain.

CASE 3. *Compound fracture of the skull with loss of brain tissue.—Recovery.*

E. H., Negro, aged 38 years; native of Virginia, laborer; was admitted to the Emergency Hospital February 6, 1901.

History.—The patient had just been struck on the head by a portion of a rapidly revolving wheel which had broken. He was not unconscious but in a dazed condition and apparently unable to talk or understand what was said to him. He had lost considerable blood and was suffering from shock, so 500 cc of normal salt solution were injected into the left median basilic vein. A wound involving scalp, skull and brain extended 15 centimetres from a point $2\frac{1}{2}$ centimetres above and the same distance in front of the right ear, backward and upward to a point 11 centimetres above the external occipital protuberance. Blood clots and brain tissue protruded along the entire

wound. There was conjugate deviation of the eyes towards the side of the injury and partial paralysis of the left side of the face and the left upper and lower extremities.

After shaving and disinfecting the head, the operation was begun, without an anaesthetic but as the patient was restless, turning his head from side to side, chloroform was given. The blood clots and brain tissue projecting and seven fragments of bone buried in the brain, were removed and a branch of the middle meningeal artery ligated. The opening in the skull was shaped like a dumb-bell, the anterior extremity about 4 centimetres in diameter, being the larger. The dura mater was so much lacerated as to render the use of sutures impossible and as the brain continued to project through the skull it was kept in place by packing over two square metres of gauze into the cavity of the skull. The scalp was then united by sutures, leaving three openings through which the ends of the gauze projected, so that it could be removed at the proper time.

February 7th, the patient was doing fairly well but decidedly apathetic and indifferent to his surroundings. Right conjugate deviation of the eyes still marked. No evidence of pain on pricking the left arm and leg and only slight on pricking the face. He was able to move the left arm and leg, but rather weakly, the arm being weaker than the leg.

February 9th, the gauze packing is renewed. A rough test shows the existence of left homonymous hemianopsia.

February 18th, the conjugate deviation has about disappeared, the patient being able to turn his eyes in any direction. His mind is clear but he seems to cerebrate slowly. Fungus cerebri occurred in each of the openings left for removing gauze, and was controlled by packing as in the beginning, changing the dressing once in two or three days.

February 27th, three weeks after the injury, the patient was permitted to get up. He was able to walk by holding to objects and dragging the left leg. He complains of a sensation of pins and needles in the left arm and leg.

March 9th, thirty-one days after the injury, the fungus cerebri has all disappeared and the surface of the brain has sunk to a distance of at least $2\frac{1}{2}$ centimetres below the surface of the skull. The left arm and leg are much stronger and the patient is able to walk about without holding to objects. The eyes were examined by Dr. Swann Burnett who confirmed the diagnosis of left homonymous hemianopsia. The test for Wernicke's symptom was not made.

When last examined, April 27th, the wounds are entirely

healed and the patient walks without limping. The left hand is almost as strong as the right but he has difficulty in approximating the thumb to the tips of the fingers so that fine movements such as buttoning his clothing, or writing with a pen, are impossible. This is not from want of strength but from absence or dullness of the tactile sense, as he can approximate them by an effort while looking at them, but is unable to do so unless he sees them. The mouth is drawn slightly to the right side. Left homonymous hemianopsia is still well marked and there is also partial deafness of the left ear. The sense of smell seems to be normal.

In this case the patient lost at least two ounces of brain. As mapped out on the skull the wound in the brain must have extended from a point just below the division of the fissure of Sylvius into its two branches, backward and upward, crossing the lower extremity of the fissure of Rolando and gradually diverging from it posteriorly as it approached the median line of the skull, involving the first temporo-sphenoidal convolution, which would account for the partial deafness; the supra-marginal and angular convolutions and, possibly, the cuneus, hence the homonymous hemianopsia.

The conjugate deviation of the eyes is not easily explained if it is assumed that this phenomenon depends on injury to the second frontal convolution, as the wound was situated some distance behind and below this convolution. The third frontal convolution might have been involved in the lesion, so it seems fair in this case to attribute the conjugate deviation to injury of this convolution.

The loss of tactile sensation in the left hand, and to a less degree in the foot, was to be expected, from injury to the posterior motor area. According to Starr, "the parts susceptible of the finest and most delicate movements, those directed by the most acute sensations—the lips, the fingers and the toes—lie furthest back in the motor area, chiefly in the posterior central convolution. Lesions in this convolution almost always cause some loss of tactile sensation as well as paralysis."

As the patient was right-handed and the injury on the right side, there were no symptoms of aphasia, no interference

with memory of any kind, as there would undoubtedly have been, had the same lesion occurred on the left side.

DISCUSSION.

LIEUT. COL. J. D. GRIFFITH, Mo.—May I just raise a question? Although I am a firm believer in it, and as there are probably some very acute neurologists here who can probably answer it,—why is it that Maj. Vaughan is so pronounced in his statement that had the injury been on the left side there would have been a complete amnesic aphasia with an inability to pronounce and articulate? Why would it not be the case if on the right side? I appreciate most heartily the paper, but I want to hear from some of these neurologists, why the same is not true of the right side as well as the left.

COL. W. W. GRANT, Colo.—There is a very practical question connected with these brain injuries as to the matter of trephining. What rule should govern the surgeon in those cases of depression, or where those persistent symptoms of depression exist, as to trephining in the absence of fracture or depression or pressure of the skull? As I understand it, to this day there is no uniform rule in this respect. I remember a railroad case a great many years ago where a man was injured and rendered unconscious and remained so for five days, although no visible depression of the skull existed, and without being permitted an examination of the injury myself to ascertain whether there was a fracture, I earnestly advised the railway surgeon to trephine, because it seemed to me there must be hemorrhage producing this compression; but I found in examining the subject that if a sufficient time is permitted to elapse many of the cases show an absence of depressed skull where the surgeon would otherwise deem himself justified in operating. I would like to know some definite rule that we can adopt in these cases. Even with slight depression it is not the rule to raise the skull if there are no symptoms of compression, and this is of the highest practical importance. I believe, in persistent symptoms of compression trephining should be used for exploratory purposes and for no other.

MAJOR GEO. HALLEY, Mo.—I have opened the skull a great many times and have had some experience along this line. It is true that quite a large number of injuries to the brain occur without fracture or depression, as related in the paper, with interstitial hemorrhage. Those cases I think are exceptional, not the rule. I think the skull can be opened

with relative immunity if it is done under ordinary aseptic precautions. I have been in the habit of teaching students in the cases of interference the necessity of the thorough removal of all the hair from the scalp and the thorough cleansing of the scalp as would be necessary were it on any other part of the body. I think this is very frequently neglected, but if the scalp is thoroughly cleaned the operation can safely be proceeded with. If practical precautions were taken, such as I have been in the habit of taking, I think the operation of opening the skull and making an exploration is exceedingly safe.

COL. W. W. GRANT, Colo.—In the history of the case I mentioned his symptoms disappeared entirely on the eighth day; on the thirteenth day he commenced to vomit, his coma returned and he died. What from?

MAJOR GEO. HALLEY, Mo.—I take it in that case there had been an interstitial hemorrhage, it had been rapidly absorbed and vomiting, due to some disturbance of the stomach, probably increased the hemorrhage, establishing a larger clot and he died of intestinal hemorrhage.

COL. W. W. GRANT, Colo.—That would have justified immediate trephining.

I have been in the habit of laying down to students a rule that I have for many years seen no reason to depart from, and that is, in every case of fracture of the skull with depression of the bone, whether it is simple or compound, it ought to be trephined and the bone elevated. Every case of fracture of the bone with depression, no matter whether there are symptoms of compression or not, the skull ought to be opened and the bone elevated because of the disastrous results that follow invariably; and I wish to emphatically state that there invariably ensues from compression of the brain in three, four or five years afterwards Jacksonian epilepsy. This is controverted by many persons who say in numerous cases this rule can be deviated from. In seeing many of these cases I have come more and more personally determined in all cases to operate. Sometimes they go on for as long as five years,—I think rarely beyond that,—and then again they have these sensations in a mild form of epilepsy which result later in a more aggravated form. Wherever there is fracture of the bone with depression and it is compound, everybody concedes the necessity of operation, of opening the skull. You have got a compound fracture and you cannot make it any worse. In all cases of brain injury a very thorough exploration should be made. A case came to me not very long ago in which the

surgeon had explored the wound but without opening it, and then washed it out and dressed the wound, but the symptoms persisted and he sent the case to me for examination. I opened the wound and found a large piece of bone adhering with the hair to the brain. In those cases it is not only necessary to open the wound, but to make a large incision in the scalp and through the bone, remove a large area and then explore the brain pulp so as to get a thorough cleaning out of the wound. It is just what you would do in the tissues elsewhere and you do little harm to the brain in your examination and taking out the broken down tissue. You are not going to make it any worse at any rate. In case there is a fracture of the bone and no depression, it becomes a question of what to do. The rule that has guided me is that wherever there are symptoms of cerebral hemorrhage among the different convolutions there is a hemorrhage that requires evacuation. They are, I take it, the most severe injuries the brain can be subjected to. They have not the manifestation of locality to guide you but where the effusion is general it is from compression of the parietes. You are not going to make it any worse to open the skull. In those cases where there is a limited area of compression you can locate very accurately the place of the hemorrhage. Where it has occurred over a large area you should immediately trephine. No matter where the injury appears to be, it is an invariable guide. You can open up the skull with absolute impunity and you can do your operation with absolute asepsis.

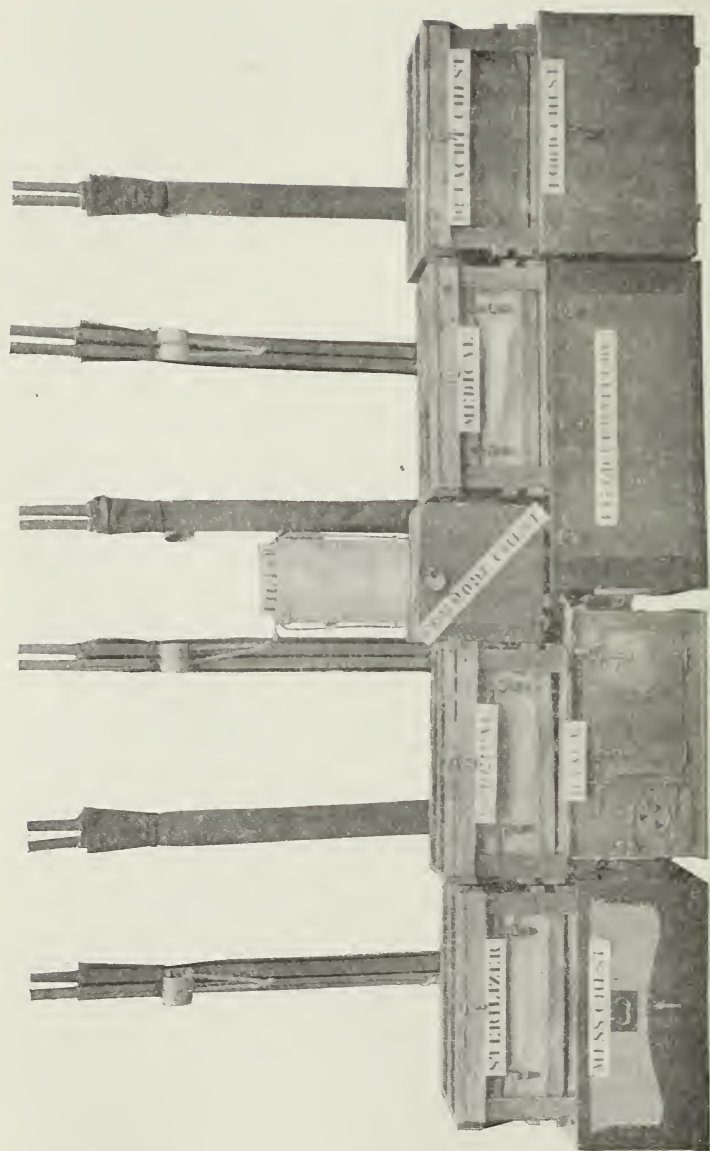
COL. R. H. REED, Wyo.—The question that is brought up by Col. Grant can partly be answered by citing a case that occurred in my practice some years ago, and it may throw a little light on the question of indiscriminate trephining. A few years ago one of our members read a paper in which he stated there was no more danger in trephining the skull than there was in opening an abscess, and I thought at the time it was a pretty strong proposition, but yet I do not know but what it is true. I was called to a case some miles south of Columbus, Ohio, where a man was paralyzed. I found the paralysis on the right side, both arm and leg. There was no bone fracture and I knew of nothing that could cause this condition except that he was struck over the head. That was all the information I could get. Upon examination I was satisfied that the brain was involved. I made an examination and found the brain bulging and with no pulsation, and I at once proceeded to a diagnosis which justified me in the belief that there was hemorrhage in the left ventricle. Passing a needle

in the left ventricle I drew out two ounces of bloody serum, and the brain commenced to pulsate. The patient got better, in two days the paralysis had disappeared and he was apparently getting well; the wound healed by first intention. In fourteen days after the operation he suddenly became worse and before I was called he died. The fact was he had been waylaid by three men who jumped on him, stamped him and kicked him, and knowing these circumstances I knew there would be a scrap on hand with the lawyers, so I proceeded to the place at once and took the pathologist of the Ohio University with me. An examination was carefully made and there was found to be interstitial hemorrhage throughout the entire cerebral mass; there was hemorrhage everywhere and the man died from that cause. Notwithstanding all the care we had taken, notwithstanding it was proven that these men had waylaid him for the purpose and with the intent of killing him, yet the lawyers claimed that the doctor killed him; the doctor put a long needle down into his brain and that was the cause of death. Now this case Col. Grant spoke of was probably a case of interstitial hemorrhage.

It is not always best to trephine when we get a chance, but at the same time I believe it is all right when we have unmistakable symptoms, but I believe there are many instances where the brain is abused with no results at all. I remember a case of a man who fell into a buzz saw and had his head split open. We held a consultation as to whether we should trephine, the majority overruled us and we did not trephine and the man did not die. In a few years it was observed he was getting as red as a boiled lobster. I took him before the Miami County Medical Society to exhibit. He was as red as a boiled lobster from head to foot, but that man lived for thirteen years after that injury. He finally died of pneumonia or some similar medical affection. I was determined to have a postmortem, and I remember distinctly I drove through mud twelve inches deep to get the autopsy. I took two other surgeons with me and we found the skull much larger than ordinary, and when I went to saw the skull I found it was too soft and I took my jack knife and reamed it around; there we found the tract drawn in some two inches long that had become attached to the inner surface of the skull and penetrated to the inner brain substance and carried the injury to the vaso motor system, causing the intense redness. I speak of this to show how desperately the brain may be injured and the person still live, and how very lightly it may be injured and it will cause death.

SURG. GEO. TULLY VAUGHAN, U. S. M. H. S. (*Closing the discussion*)—I just want to make a few remarks in reply to what Col. Griffith said. They simply tend to prove the theory that has been sustained in so many cases that injuries to the left side of the brain have produced aphasia. There was no evidence of aphasia in this case, no interference with the tongue that might not happen in an injury on either side of the brain. In this case the man's memory, as soon as he began to show any at all, was all right; he remembered anything that had taken place; he could write, read and talk as well as he ever could. That would confirm all theories I know of in regard to aphasia being due to injury on the left side. This was on the right side, so the man had no aphasia, he was a right handed man.

I think I can add something to elucidate Col. Grant's problem. I had a patient a good many years ago who was knocked down with a shovel. He was unconscious for some time. He was admitted to the hospital, I examined him carefully and could find no fracture, only a little contusion, but I decided to keep him in the hospital. At the end of seven days he became unconscious and before doing so he had a convulsion. He was not comatose, he was unconscious for probably a half hour after the injury, when he came to and seemed to be all right until the seventh day when he became unconscious with this convulsion. I opened the side of the head corresponding with the injury on the head and when I exposed the skull I found a linear fracture. I found no displacement, but I found a clot on the outside of the dura mater, this was removed and the man recovered. There are quite a number of cases of this kind. I have seen a number of cases of fatal hemorrhage without any fracture of the skull. One case I had was that of a man who staid at the police station all night. He was brought to the hospital next morning and I found him paralyzed on one side. He had a contusion on the other side of the head, but being guided by the symptoms I opened the opposite side of the skull from where the injury occurred and found several blood clots under the dura mater. I explored the lateral sinus in that case. This patient did not improve but died. In this case there was no fracture of the skull. There were hemorrhages in both lobes of the brain; the right lateral ventricle was full of blood, therefore the question comes whether the passing of the exploring needle directly into the hemorrhage was of any good. I have tried it in three operations and never got any good results. If the blood is clotted it cannot run through any trocar. I know of but one case and I do not know that it did any good in that, and that was a case where the surgeon split open the lateral ventricle and removed the clot, but his patient died.



REGIMENTAL MEDICAL FIELD EQUIPMENT, U. S. ARMY, 1901.

REGIMENTAL FIELD EQUIPMENT, MODEL OF 1901, FOR THE MEDICAL DEPARTMENT OF THE REGULAR ARMY.

By MAJOR JOHN VAN RENSSELAER HOFF,

WASHINGTON, D. C.

SURGEON IN THE UNITED STATES ARMY: LIEUTENANT COLONEL
AND CHIEF SURGEON OF UNITED STATES VOLUNTEERS.

I DESIRE to invite the attention of the gentlemen of the Association to the regimental medical equipment of the regular army which is here presented for your consideration; and indeed to the whole question of equipment. This equipment is the present result of our experience, but as there is scarcely a gentleman here who has not had field service during the last three years, I thought it well to submit these chests for examination and discussion, with a view to getting any suggestions the members may have to offer. All who have seen and used these chests have spoken very favorably of them. A regimental outfit,—three months supply,—consists of:

1.—MEDICAL CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Acidum nitricum, bottle in wooden case	Bott.	1, Right Bottom
Acidum sulphuricum aromaticum	Bott.	1, Right Bottom
Aetheris spiritus nitrosi	Bott.	1, Right Bottom
Ammoniae spiritus aromaticus	Bott.	1, Right Bottom
Alcolia burners	No.	6, Right Bottom
Amyl nitris, pearls	Box	1, Drawer
Argenti nitras, cones, in tin	Tin	1, Left Tray
<i>Atomizer. hand</i>	No.	1, Left Tray
<i>Bags, hot water and syringe</i>	No.	2, Left Tray
Bismuthi subgallas	Tin	1, Left Bottom
Bismuthi subnitras	Tin	1, Left Bottom
Blank book	No.	1, Left Tray
<i>Bottles, large,</i>	No.	6,
Boxes, ointment, nests of 3	Nests	8, Right Bottom
<i>Corkscrew</i>	No.	1, Left Tray
Corks, extra for 250 c. c. botts	No.	6, Right Bottom
Corks for vials	No.	48, Right Bottom

<i>Cover for chest,</i>	No. 1.	
<i>Crate.</i>	No. 1.	(Also used as a stand for chest)
<i>Cups, drinking (nested)</i>	No. 2.	Left Tray
Envelopes for tablets	No. 500.	In Both Trays.
Emplastrum belladonnae, 4 meter tin	Tin 1.	Right Bottom
Emplastrum, cantharidis, 1 meter tin	Tin 1.	Right Bottom
Emplastrum sinapis, 8 meter tin	Tin 1.	Right Bottom
<i>Graduate with leather cover</i>	No. 1.	Right Bottom
Glycerinum	Bott. 1.	Right Bottom
Labels for vials	No. 50.	Right Tray
Magnesii sulphas	Tins 2.	Left Bottom
Medicine droppers	No. 6.	Drawer
<i>Medicine glass in wooden box</i>	No. 1.	Left Tray
<i>Mortar and pestle</i>	No. 1.	Left Tray
Oleum terebinthinae	Bott. 1.	Right Bottom
Paper, litmus	Book 1.	Drawer
Pencils, camel's hair	No. 12.	Drawer
Pencils, lead	No. 2.	Left Tray
Petrolatum	Tin 1.	Left Bottom
Pill-tile	No. 1.	Right Bottom
Potassii et sodii tartras	Tin 1.	Left Bottom
<i>Spatula</i>	No. 1.	Left Tray
<i>Stethoscope, double</i>	No. 1.	Left Tray
<i>Stomach tubes</i>	No. 2.	Left Tray
<i>Syringes, hypodermic with 6 Lotiles tablets</i>	No. 2.	Drawer
Syringe, hypodermic needles	No. 12.	Drawer
Syringes, p. glass in wooden cases	No. 6.	Left Tray
<i>Syringe, rectal, hard rubber.</i>	No. 1.	Left Tray
Tablets. acidum arsenosum, 1 mgm.	Tin 1.	Left Tray
Acidum boricum, 324 mgm.	Tin 1.	Right Tray
Acidum tannicum, 324 mgm.	Tin 1.	Right Tray
Ammonii chloridi trochisci	Tin 1.	Left Bottom
Antipyrinum, 324 mgm.	Tin 1.	Right Tray
Antiseptic	Tin 1.	Left Bottom
Caffeina citrata, 65 mgm.	Tin 1.	Left Tray
Chloral, 324 mgm.	Tin 1.	Right Tray
Codeina, 32 mgm.	Tin 1.	Left Tray
Colchicum ext. fl. 0.065 c. c.	Tin 1.	Left Tray
Cupri arsenis, 0.325 mgm.	Tin 1.	Left Tray
Digitalis tinctura, 0.3, c. c.	Tin 1.	Left Tray
Glycyrrhizae mistura composita $r=4$ c. c.	Tin 1.	Right Tray
Guaiacolis carbonas, 324 mgm	Tin 1.	Left Tray
Hydrargyri chloridum mite, 130 mgm	Tin 1.	Right Tray
Hydrargyri iodidum flavum 10 mgm	Tin 1.	Right Tray
Hypodermic, Apomorphinae hydrochloras 6 mgm	Bott. 1.	Drawer
Atropinae sulphas, 0.65 mgm	Bott. 1.	Drawer
Cocaina hydrochloras, 10 mgm.	Bott. 1.	Drawer
Digitalinum, 1 mgm	Bott. 1.	Drawer
Hyoscinae hydrobromas, 0.65 mgm.	Bott. 1.	Drawer
Morphinae sulphas, 8 mgm	Bott. 1.	Drawer
Nitroglycerinum, 0.65 mgm	Bott. 1.	Drawer
Strychninae sulphas, 1. mgm	Bott. 1.	Drawer
Quininae hydrochlorosulphas, 65 mgm.	Bott. 1.	Drawer

One tube of each of the above hypodermic tablets excepting Quin. hydrochlorosulph.		Tubes 8, Drawer
Ipecacuanhea et opii pulvis, 324 mgm		Tin 1, Left Bottom
Linimentum rubefaciens		Tin 1, Right Tray
Tablets, Oleum tiglii, 0.006 c. c.		Tin 1, Left Tray
Opium tinctura camphorata 1=4 c. c.		Tin 1, Right Tray
Phenacetinum, 324 mgm.		Tin 1, Left Bottom
Pilulae aloini compositae		Tin 1, Left Tray
Pilulae camphorae et opii		Tin 1, Left Bottom



U. S. A. REGIMENTAL MEDICAL CHEST, MODEL OF 1901.

Pilulae carminativae	Tin 1, Right Tray
Pilulae catharticae compositae	Tin 1, Left Bottom
Pilulae copaiba compositae	Tin 1, Left Bottom
Plumbi acetat, 130 mgm.	Tin 1, Left Tray
Podophylli resina, 16 mgm.	Tin 1, Left Tray
Potassii bicarbonas, 324 mgm	Tin 1, Left Bottom
Potassii iodidum, 324 mgm	Tin 1, Left Bottom
Potassii permanganas, 324 mgm.	Tin 1, Right Tray
Quininae sulphas, 200 mgm.	Tins 3, Left Bottom
Rhamni purshiana ext., 130 mgm.	Tin 1, Left Tray
Salol, 324 mgm.	Tin 1, Right Tray
Sodii bicarbonas, 324 mgm.	Tin 1, Right Tray

Sodii bicarbonas et menth, pip.	Tin	1, Right Tray
Sodii bromidum, 324 mgm.	Tin	1, Left Bottom
Sodii salicylas, 324 mgm.	Tin	1, Left Bottom
Sulphonol, 324 mgm.	Tin	1, Left Bottom
Warburg's tincture, 1=4 c. c.	Tin	1, Right Tray
Zinci sulphas, 324 mgm.	Tin	1, Left Tray
<i>Tape measure</i>	No.	1, Drawer
<i>Tea Spoon</i>	No.	1, Left Tray
Test tubes, in nests of 3	Nests	2, Drawer
<i>Thermometer, bath</i>	No.	1, Left Tray
Thermometers, clinical	No.	4, Drawer
Tins, not expendable	No.	52,
<i>Tongue Depressor</i>	No.	1, Left Tray
Towels, hand	No.	6, Left Tray
Trusses, single, either side	No.	3, Left Tray
Vials, empty, 30 c. c.	No.	18, Right Bottom
Vials, empty, 60 c. c.	No.	12, Right Bottom
Washers, rubber, extra for tins, in round tin	No.	52, Right Bottom

2. SURGICAL CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Alcohol	Botts.	2, Right Bottom
Alcolia, burners, filled	No.	6, Left Bottom
<i>Aspirator</i> , the rubber stopper fits the 750 c.c. botts.	No.	1, Left Bottom
<i>Bags, hot water and syringe</i>	No.	2, Left Bottom
Bandages, gauze (11 in left bottom)	No.	54, In both trays
<i>Bandages, rubber</i>	No.	2, Right Tray
Bandages, suspensary	No.	4, Left Bottom
Blank Book	No.	1, Left Tray
<i>Bottles</i> , not expendable	No.	12,
<i>Bougies</i> , in flat tin	No.	6, Left Tray
Brandy	Botts.	2, Right Bottom
<i>Cans</i> , not expendable	No.	6,
<i>Case, Gen'l. operating, with strap</i>	No.	1, Cent'r Bottom
<i>Case, pocket operating, with cover</i>	No.	1, Left Tray
<i>Case, tooth extracting</i>	No.	1, Left Bottom
<i>Catheters. soft rubber</i> , in flat tin	No.	6, Left Tray
Chloroform	botts.	8, Right Bottom
<i>Corkscrew</i>	No.	1, Right Tray
Corks, extra for 250 and 750 c. c. botts.	No.	12, Right Bottom
Cotton, absorbent, in 30 gm. pkgs.	Pkgs.	8, Right Tray
<i>Cover for chest</i> , not expendable,	No.	1,
<i>Crate</i> , not expendable	No.	1, Used also as a stand for chest
<i>Cups, drinking</i>	No.	2, Right Tray
Gauze, sublimated, 1 meter pkgs.	Pkgs.	12, Right Tray
<i>Inhaler, chloroform, Esmarch's</i>	No.	1, Left Tray
<i>Iodoform, sprinkler</i> , filled	No.	1, Right Tray
Ligatures, catgut, 3 sizes, sterilized	No.	99, Left Tray
Ligatures, silk, 3 sizes, sterilized	No.	81, Left Tray
Matches,	boxes	6, Right Tray
Pencils, lead,	No.	6, Right Tray
Petrolatum	tins,	2, Left Bottom
Pins, common	papers,	2, Right Tray

Pins, safety	cards	8, Right Tray
Plaster, adhesive	spools	6, Right Tray
Plaster, isinglass	roll	1, Right Tray
Razor	No.	1, Right Tray
Razor strop	No.	1, Left Bottom
Shears	No.	1, Right Tray
Speculum, rectal	No.	1, Left Bottom
Sponge holders, throat	No.	2, Right Tray
Syringe, hypodermic, with 6 bottles tablets	No.	1, Drawer



U. S. A. REGIMENTAL SURGICAL CHEST, MODEL OF 1901.

Syringe, hypodermic, needles	No.	12, Drawer
Surgery, <i>Zuckerhandl</i>	No.	1, Left Tray
Tablets, antiseptic	tin.	1, Left Bottom
Hypodermic, apomorphinae hyd., 6 mgm.	bott.	1, Drawer
Atropinae sul., 0.65 mgm.	bott.	1, Drawer
Cocaina, hyd. 10 mgm.	bott.	1, Drawer
Digitalinum. 1 mgm.	bott.	1, Drawer
Morphinae sulphas, 8 mgm.	bott.	1, Drawer
Nitroglycerinum, 0.65 mgm.	bott.	1, Drawer
Quininae hydrochlo, 65 mgm.	bott.	1, Drawer
Strychninae sulphas. 1 mgm.	bott.	1, Drawer
One tube of each of the above hypodermic tablets except Quin. hydrochlo.	tubes	7, Drawer
Tablets, Saline solution, normal	tin	1, Left Bottom
Sodii carbonas, 2 gm.	tin	1, Left Bottom

Tags, diagnosis	books	4, Right Tray
Thermometers clinical	No.	4, Drawer
<i>Tourniquets, strap and chain</i>	No.	2, Right Tray
Towels, hand	No.	6, Left Bottom
Tubes, drainage, 2 sizes in flat tin	pieces	2, Left Tray
Washers, extra, for cans, in flat tin	No.	5, Left Tray
Wire, silver	coil	1, Drawer

3. STERILIZING CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Acidum Carbolicum	botts.	2, Under Tray
Alcolia, in 1 Kilo tins	tins	2, Front
Alcolia, burners, filled	No.	6, front 2 in tray
<i>Apron, rubber</i>	No.	3, In Sterilizer
Bands, rubber	No.	32, In Sterilizer
<i>Basins, rubber</i>	No.	4, In Sterilizer
Brushes, hand, scrub	No.	6, In Tray
Cans, tin,	No.	6.
Corks, for 250 c. c. botts	No.	6, In Tray
Cots, finger	No.	16, In Sterilizer
<i>Cover, canvass</i> for chest,	No.	1,
<i>Crate for Chest</i>	No.	1, Used also as a stand for chest
<i>Filter</i> , with stirrup, intake tube, directions, extra washers and extra cylinder,	No.	1, Bottom, front
<i>Gloves, rubber</i>	pairs	4, In Sterilizer
Matches	boxes	6, In Tray
Plaster of Paris, in 1 Kilo tins	tins	2, Under Tray
<i>Pouches for gloves</i>	No.	2, In Sterilizer
Soap, green, in 500 gm. tins	tins	2, Under Tray
Soap, germicidal	cakes	5, In Tray
<i>Soap Box</i> , with soap	No.	1, In Tray
Splints, wire gauze	pcs.	12, Front
Splints, wood	pcs.	10, Front
<i>Sterilizer</i> , instrument and dressing	No.	1, Back
Tags, diagnosis	books	4, In Tray
<i>Tool, Universal</i>	No.	1, In Tray
Towels, hand, (12 under tray)	No.	24, In Sterilizer
Trikresol	botts.	2, Under Tray
Washers, rubber, extra for cans	No.	8, In tin can in tray.

DIRECTIONS FOR FILTRATION.

The directions printed on cloth which accompany each Berkefeld filter should be closely complied with.

The Maignen filter simply clears the water by removing the solid matter in suspension. Filtration through it should be regarded as preparing the water for the smaller filter. It cannot be depended upon to render a suspicious water safe to drink. Unless the water is perfectly clear, the Berkefeld filter quickly becomes clogged, pumping if continued becomes laborious, and there is danger that the pump will break under the increased pressure. Some experiments would also seem to indicate that bacteria may be forced through the filtering cylinder if the pressure is greatly increased. The Maignen filter should therefore be first used if the water is even slightly turbid, and the cylinder of the Berkefeld filter should be removed and brushed clean as soon as the pumping becomes difficult.

The Berkefeld filter if not sterilized by frequent boiling allows the passage of bacteria even under moderate pressure, and may in time furnish a water which contains a larger amount of bacteria than the same water unfiltered. *It must be distinctly understood that the main reliance for the sterilization of water should be upon boiling.* The filters are intended to be used to supply water on the march or under other conditions where it is not practicable to boil water.

DIRECTIONS FOR USING THE BOECKMANN STERILIZER.

Open the swinging supports underneath the Sterilizer. Place two alcoholia burners in the metal frame so that the flame from each will come in contact with the bottom of the Sterilizer at equal distances from the central opening.



U. S. A. REGIMENTAL STERILIZING CHEST, MODEL OF 1891.

Remove the wire tray from the water pan and fill the latter two-thirds full of water. Place the articles to be disinfected in the sterilizing chamber placing the cover on this chamber, being sure to remove the brass cap from same. Place the outer cover over the chamber, leaving the metal cap in place. The generated steam collecting underneath the cover will find its way into the chamber, forcing the air from the latter out through the opening in the bottom of the apparatus. All surplus steam will pass out through the same opening.

After sterilizing for twenty minutes, remove the outer cover and the sterilizing chamber. If instruments are to be sterilized, lay them in the wire tray and place the latter in the boiling water. Return the sterilizing cham-

ber and outer cover, removing the metal cap from the latter. Heated air will then pass upward through the apparatus, thoroughly drying the contents. After boiling five minutes, the dressings and instruments may be removed. If the opening in the cover of the sterilizing chamber be closed with the metal cap, it may then be inverted and used as an instrument tray.

Be particular to thoroughly dry the sterilizer after using it.

4. DETACHED SERVICE CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Acidum carbolicum, cryst.	tin	1, Left Bottom
<i>Aprons, rubber, (in bag)</i>	No.	2, Left Tray
Bands, rubber (in pouch)	No.	10, Left Tray
<i>Bag, hot water and syringe</i>	No.	1, Right Tray
<i>Bag for towels, etc.,</i>	No.	1, Left Tray
Bandages, gauze (18 under right tray)	No.	95, Both Trays
Bandages, plaster of paris	No.	6, Right Bott'm
Bandage, rubber	No.	1, Left Tray
<i>Basins, rubber (in bag)</i>	No.	2, Left Tray
<i>Bottles, large.</i>	No.	3,
Bismuthi subgallas, pulv.	tin	1, Left Bottom
Bismuthi subnitras, pulv.	tin	1, Left Bottom
Blank book	No.	1, Small Tray
Boxes, ointment wooden in nests of 3	nests	8, Right Tray
Brushes, hand, scrub	No.	6, Left Tray
<i>Cans, tin, not expendable</i>	No.	21,
<i>Case, pocket operating</i>	No.	1, Left Tray
<i>Catheters, soft rubber, in tin</i>	No.	3, Left Tray
Chloroform (bottles not expendable)	Botts.	3, Left Bottom
Cots, finger, rubber. (in pouch)	No.	8, Left Tray
Cotton, absorbent, 1 oz. packages	No.	26, Right Bott'm
<i>Cover, canvas, for chest</i>	No.	1,
<i>Crate for chest</i>	No.	1, Used also as a stand for chest
<i>Cup, drinking</i>	No.	1, Left Tray
Envelopes for tablets	No.	150, Left Tray
<i>Forceps, hemostatic</i>	No.	6, Left Tray
<i>Forceps, tooth extracting</i>	Set	1, Left Tray
Gauze, iodoform, 1-2 meter packages	No.	14, Right Bott'm
Gauze, sublimated, 1 meter packages	No.	35, Right Bott'm
<i>Gloves, rubber, in pouch (in bag)</i>	No.	2, Left Tray
<i>Inhaler, Esmarch's</i>	No.	1, Right Tray
<i>Iodoform sprinkler, filled</i>	No.	1, Right Tray
Ligatures, cat gut, sterilized	No.	24, Left Tray
Ligatures, silk, sterilized	No.	21, Left Tray
Magnesii, sulphas, cryst.	tin	1, Left Bottom
<i>Medicine glass (in cup)</i>	No.	1, Left Tray
<i>Mortar and pestle</i>	No.	1, Left Tray
Pencils, lead	No.	2, Left Tray
Petrolatum	tin	2, Left Bottom
Pins, common,	paper	1, Left Tray
Pins, safety	card	1, Left Tray
Plaster, rubber, adhesive	spools	3, Right Tray
Plaster, sinapis	tin	1, Left Tray
<i>Pouches for gloves</i>	No.	1,
<i>Razor</i>	No.	1, Left Tray

<i>Razor Strop</i>	No.	1, Left Tray
<i>Shears</i>	No.	1, Small Tray
Soap, germicidal	cakes	2, Right Tray
<i>Soap box</i> with soap	No.	1, Left Tray
<i>Spatula</i>	No.	1, Small Tray
Sponges, cotton, compressed	box	1, Right Tray
<i>Spoon, tea</i>	No.	1, Small Tray
<i>Syringe</i> , hypodermic, with 6 bottles of tablets	No.	1, Left Tray
Syringe, hypodermic, needles	No.	12, Left Tray
Tablets, antiseptic	tin	1, Left Bottom



DETACHMENT MEDICAL AND SURGICAL CHEST, MODEL OF 1901.

Glycyrrhizae mist. comp.	tin	1, Left Bottom
Hydrargyri mite 130 mgm	tin	1, Left Bottom
Hypodermic, Apomorph. hyd	bott. 1	} tin 1, Left Bottom
Atropinae sul	bott. 1	
Cocainae hyd	bott. 1	
Digitalinum	bott. 1	
Morphinae sul.	bott. 1	
Nitroglycerinum	bott. 1	
Quin. hyd	bott. 1	
Strychninae Sul	bott. 1	
Phenacetinum	tin	1, Left Bottom
Pil. camph. et opii	tin	1, Left Bottom
Pil. carminativae	tin	1, Left Bottom
Pil. cath. comp.	tin	1, Left Bottom
Pil. copaib. comp.	tin	1, Left Bottom

Potassii brom.	tin	1, Left Bottom
Quin. sul.	tins	3, Left Bottom
Sodii salicylas	tin	1, Left Bottom
<i>Thermometers, clinical</i>	No.	6, Small Tray
<i>Tongue, depressor</i>	No.	1, Small Tray
<i>Tourniquet, strap and Chain</i>	No.	1, Left Tray
Towels, hand (in bag)	No.	6, Left Tray
Tubes, drainage, 2 sizes in tin	No.	2, Left Tray
Washers, extra for tins, in tin	No.	16, Left Tray

5. MESS CHEST.

6. FOOD CHEST.

7. COMMODE CHEST.

8. FURNITURE CHEST.

9. RANGE.

10. FILTER.

11. HAND LITTERS.

As you know, during the Spanish-American war and since we used the chests adopted in 1898. Five chests made up the set—2 medical, 2 surgical, and 1 sterilizer, and while they met the conditions, yet they were open to criticism. At the close of that war, the Surgeon General convened a Board of Medical Officers to consider the entire subject of sanitary equipment from the standpoint of active service conditions. A very important part of the result of their deliberations is the regimental hospital equipment now before you, for the assembly and arrangement of which great credit is due Major Geo. E. Bushnell, Surgeon, U. S. A. The Department is indebted to Mr. Chas. Truax for a number of valuable suggestions in the technicalities of packing; he is the contractor for the manufacture of the chests now before you.

This suggests another question which must have impressed itself upon your minds, and that is the exceeding desirability of having uniformity of equipment in the national guards of the different states and in the regular service. If there is any suggestion you have to offer as a compromise between what you require and what we here offer, I should be glad to have it as it will be better to make a chest that can and will be universally used than for each State to have its own equipment different from ours, a fact which if not now appreciated

will be when the nation is again in arms and our present Guard surgeons become a part of the national forces.

I would be glad to have you look over this equipment and consider it from all points of view, and then let us know what you want and we will see what compromise can be made, if compromise be necessary.

DISCUSSION.

MAJ. M. R. ROOT, Colo.—I do not know that there is much more to add to what has been said as to the uniformity of equipment. I think the equipment should be as nearly uniform with that of the regular army as possible. As to uniformity of organization that also strikes me as being of great importance, keeping as close as possible to the regular establishment and following in its footsteps. In case we should be called into the field, as we were in the Spanish-American war, it would avoid a good many complications in the national guard that existed heretofore. In Colorado we keep as close as possible to the regular establishment, in the dispensing of supplies, drugs, etc., and we would be pleased to hear expressions from members from different states as to what would be the proper course to pursue in bringing about a uniform organization and equipment in the medical department of the national guard.

LIEUT. COL. JOS. K. WEAVER, Pa.—I was not present when the matter was brought up and discussed, but I am very glad to add my tribute to and concurrence in what has been said along those lines. In Pennsylvania we have for several years endeavored to conform ourselves to the army branch in our equipment so far as it was possible to do so. A year ago or more I furnished the national guard regiments of Pennsylvania something like the chest then in use in the army, but I observed this morning that they have changed their equipment somewhat, yet ours sufficiently approximates it to make them practically the same thing. The efficiency of the guard is greatly increased I am sure by approximating so far as we possibly can to the equipment of the regular army. In Pennsylvania as a matter of economy and convenience we have made up a medical and surgical supply list. The chests come from a pharmacist who has the contract for furnishing them, and when called for these chests are sent to the regiment with the supply lists of contents accompanying them, so that every surgeon knows what is in them, and he is expected to

treat such complaints and ailments as come to his notice with what is in those chests. By this, we save a great cost to the state, we make a uniformity of equipment so far as the drugs are concerned, and we get better results than if the surgeons made out their own requirements. We get all the standard drugs, we save the trouble of transportation, we get drugs that are thoroughly reliable and that are all familiar to our surgeons who are all of them men of experience, many of them having seen service in the last war.

I believe there is room in our army for improvement along this line of medical and surgical supplies. I believe the supply list can be greatly simplified at a great saving to the government aside from the score of greater convenience.

I observe the tablets and triturations are put up in japanned tin, which is a great improvement over ours which are in glass and liable to be broken.

I am glad to see this exhibition of equipment and we should aim to keep as closely as possible to this standard. The great fault of our surgeons during the war was the lax way they did their paper work, and if we can adapt our blanks as nearly as possible to those of the army, simplify them somewhat, making them less numerous, I believe our surgeons will have no difficulty whatever in making out their requisitions and keeping track of everything that goes out and comes in. I am in favor of an effort being made upon the part of the national guard to make its equipment conform in every respect to that of the regular army as near as it is possible to do so.

I think when the national guard of Pennsylvania starts out it will be very difficult to distinguish the equipment of a volunteer soldier from that of a soldier of the regular army.

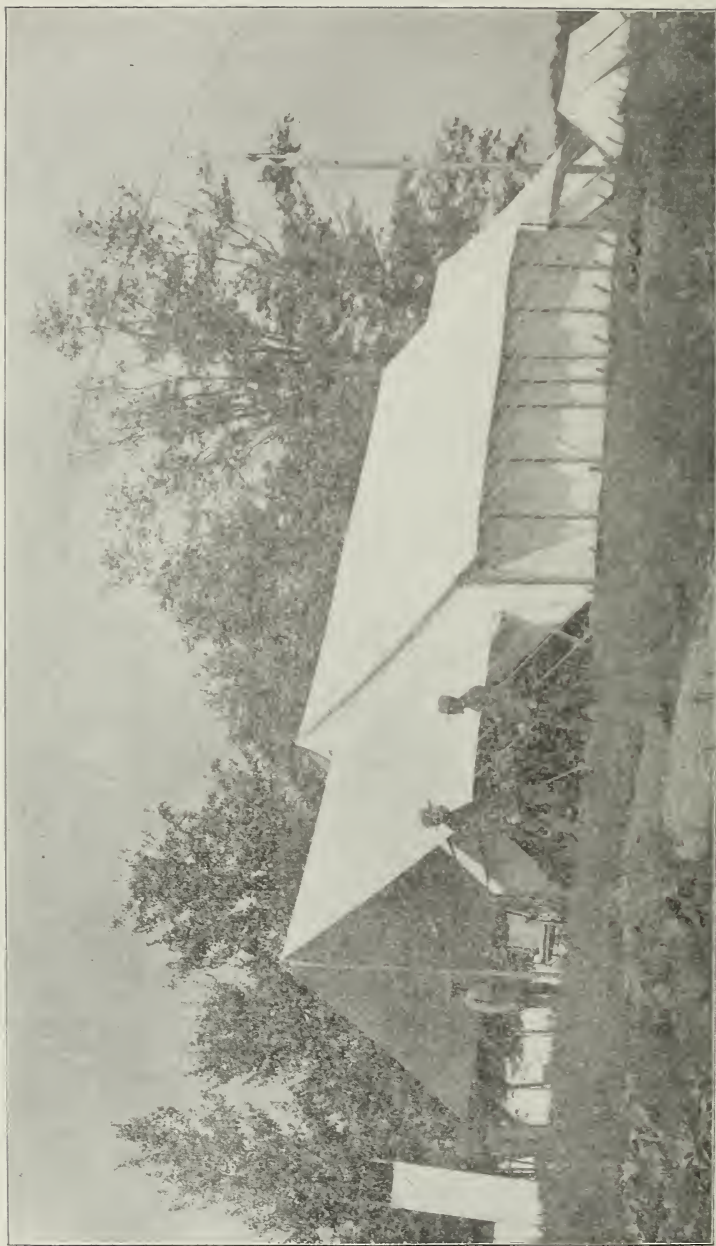
COL. W. W. GRANT, Colo.—I think no good man would doubt the desirability of having the national guard in every state of the union absolutely the same in equipment, rank and organization as the regular army. It seems to me it would simplify the work in every respect and every man would know what he is to meet when brought in contact with other people. How is it to be done, by statutory or congressional action? I cannot exactly settle that question. We can exercise our medical influence to bring it about in our own states, but there should be uniformity of action throughout. The statutes of Colorado settle the matter as far as it is possible to do so. We have six surgeons outside of the surgeon general. I am subject only to the order of the governor and the hospital corps is under my order. That is the way it should be all over the country, but I venture to say it is not so. How to bring this

about is the question, and this discussion may bring out the best way to go to work about it.

MAJOR J. VAN R. HOFF, U.S.A.—It seems to me the key note of the situation is struck by the Surgeon General of Colorado in his statement that we must have uniformity of organization and equipment in the medical department of the State troops, and then of course these organizations and equipments must correspond as closely as possible with those of the regular establishment. We recognize that the regular establishment is yet by no means perfect, but we are striving to make it as perfect as possible.

One reason why I had these chests brought here yesterday was to invite criticism upon our present equipment, with a view to its perfecting, for I believe, Mr. President, among the most important things this Association has to do is to exert its influence to bring about a perfect organization and equipment of our medical departments, state and national.





THE PENNSYLVANIA BRIGADE HOSPITAL TENT.—1900.

THE PENNSYLVANIA BRIGADE HOSPITAL TENT.

By LIEUTENANT HERBERT A. ARNOLD.

ARDMORE, PENNA.

ASSISTANT SURGEON IN THE NATIONAL GUARD OF
PENNSYLVANIA.

THE ANNUAL ENCAMPMENTS of the National Guard furnish an opportunity for practical study and experimentation along the line of the best care for the sick and disabled.

The Pennsylvania National Guard is not satisfied with past accomplishments or present attainments, but seeks to add to the comfort and facilitate the return to duty of every citizen soldier who is so unfortunate as to be incapacitated for duty during his active service. Of our number there are none more zealous in looking after the Pennsylvania guardsman's welfare than our division quartermaster, Lieutenant Colonel W. F. Richardson, who, as Superintendent of the State Arsenal, has facilities for putting into execution his ideas of shelter and comfort.

This tent, which Col. Richardson designates "The Pennsylvania Brigade Hospital Tent," is described by him as follows:

"Length of tent 32 feet.

Width of tent 18 feet.

Divided into two apartments 16x18 feet.

Apartments fastened on wall by snap hooks and rings.

Height of wall 5 feet 2 inches.

Two ridges each 16 feet long.

Three uprights each 12 feet 9 inches.

Nine side poles one either side each 5 feet 9 inches.

Fly on top.

"One end of this tent, 16x18 feet, is equipped as a regular hospital, with six cots furnished complete, with mosquito bars attached to each cot; also writing table, wash stand, commode,

slop bucket, pitcher and bowl, strips of carpet in front of each cot, small table between the cots, two rocking chairs and two folding camp chairs, and floored.

"Ventilation on each end of the tent that works by ropes, dropping ventilator down when required.

"The entire wall can be taken off of either side as they are fastened by snap hooks on wall to a ring sewed in on eave of tent.

"The tent is properly protected from storm by guy lines, and when properly erected it is the most complete and substantial tent of the kind ever used for any field purpose."

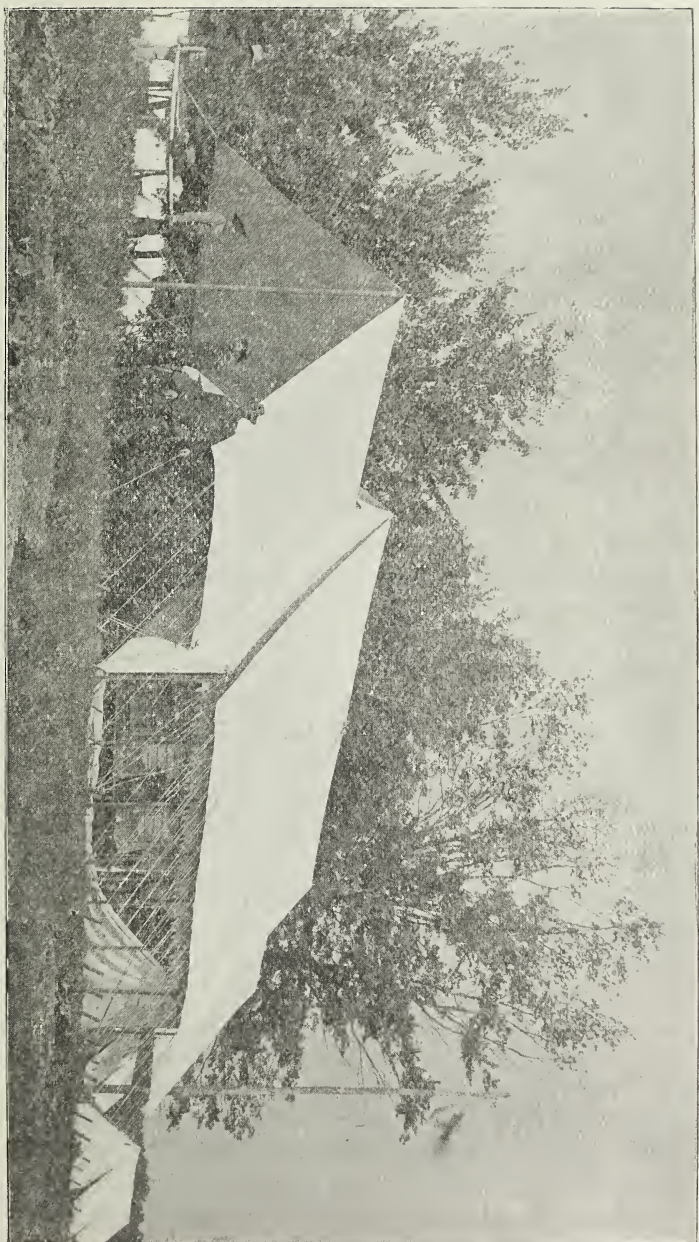
Pennsylvania, in addition to the annual encampment of the entire division, provides also for annual rifle matches when teams from each regiment of infantry and troop of cavalry spend a week at Mt. Gretna in a model camp.

The hospital tent just described was used for the first time at the camp during the rifle matches September 1900, and having had the honor to be detailed as medical officer during the matches it was my privilege to first test it in a practical manner.

It is not necessary to further describe it, except to call your attention to the fact that the central partition may be separated in the same manner as the end wall of the regular hospital tent, or may be entirely detached, making one apartment 18x32 feet. This space is larger than two conjoined ordinary hospital tents, which are each 14x15 feet.

The necessity for a well ventilated, strongly constructed yet easily managed hospital tent for tropical service was never so great as now, when American troops, in Cuba, Porto Rico and the Philippines are for the first time experiencing campaigning under conditions that call constantly for tentage that will afford shelter without oppression.

The special feature of this tent is its detachable wall. The wall of the ordinary hospital tent must be reefed up along one entire side at least to present a neat appearance, and even then the wall interferes to a certain extent with ventilation; whereas the wall of this tent may be partially detached at either side, dropped along one or both sides, or entirely removed. In this way free ventilation may be se-



THE PENNSYLVANIA BRIGADE HOSPITAL TENT.—WALL LOWERED.

cured for some cots while others are sheltered, and yet the tent will preserve a neat appearance.

Temporary privacy may be obtained by raising the wall opposite one or more cots. The facility with which this may be accomplished is a matter of which I can speak from experience.

Sagging of the sides of the tent is prevented by detachable side poles. These poles also serve to give stability to the tent.

The ventilating openings at each end, near the ridge, are covered by flaps that may be instantly raised or lowered by means of ropes passing through rings.

A glance at the accompanying photographs will show a system of bracing that enables the tent to withstand very severe wind storms.

While encamped in the mountains of Porto Rico, a cloud-burst a few miles beyond us caused a rapid rise in the creek near our camp, and necessitated the hurried abandoning of our tents in consequence of inundation. Three feet of water ran through our hospital camp. Our tents remained standing, and on recovering them next morning the walls were in a wretched condition from the deposition of filth left by the receding water. With a tent of this character the removal of the side walls would have left the roof and fly above the water and the tent uncontaminated.

In the event of soiling, the detachable walls may be more readily cleansed and handled than those inseparably fastened to the roof.

I have endeavored to give you, as briefly as possible, the salient points of advantage in the Pennsylvania Brigade Hospital Tent, and commend it to your notice as worthy of extended trial, feeling satisfied that it will meet all demands and prove a boon to the unfortunates whom the Medical Department strive earnestly to return to duty at as early a date as possible.

Personal experience enables me to testify as to its practi-

cability, and declare the tent beyond the stage of experimentation.

Ardmore, Pa., May 17, 1901.

DISCUSSION.

P. A. SURG. C. P. WERTENBAKER, U.S.M.H.S.—I would like to ask Lieut. Arnold as to the color of the canvas used, whether it is white or khaki?

LIEUT. H. A. ARNOLD.—The color was white; we use no other color in the national guard.

P. A. SURG. WERTENBAKER—Can you give an idea of the cost of manufacture of the tent?

LIEUT. ARNOLD—I can get that from Col. Richardson; he can give the cost at any time.

P. A. SURG. WERTENBAKER.—I have a good deal of that sort of thing to do in detention camps, and I am interested in the details.

LIEUT. ARNOLD.—Col. Richardson can give you all the details. The cost of everything manufactured can be accurately computed.

LIEUT. COL. JOSEPH K. WEAVER, Pa.—I would like to say a little about this tent which is one that fills a long felt want so far as the care of the sick is concerned in the encampment. During the last war it was demonstrated that there was need of a regimental and brigade hospital. In our three brigades we used one of these tents as a brigade hospital, using the regimental hospital for temporary work for which two men are sufficient. If a man is unfitted for duty for twenty-four hours he will be sent to the brigade hospital. While we have not had practical experience with the tent we propose during the coming summer to use it as a brigade hospital. I can commend this tent to the consideration of surgeons of this Association and I shall report upon the practical use of it during our next encampment.

SOME POINTS IN MILITARY SURGICAL PRACTICE.

REMARKS BY BRIG. GEN. JEFFERSON D. GRIFFITH.

KANSAS CITY, MO.

SURGEON GENERAL, RETIRED, OF MISSOURI.

I HAVE no regular paper to submit. I have a little to say,—a very little. In our practice of the profession of medicine we live in an age which may be designated as one of co-operation and mutual helpfulness. Each day brings to light some new truth, and the medical man who imparts such truth for commercial considerations has placed upon himself a stigma that does not belong to our profession; it belongs to no physician, surgeon or otherwise, and this principle has come down to us through all medical literature.

I. I would ask the military surgeon of today to be kind enough to look to his men carefully, not to those with varicocele, not to those with hernia,—we can see those things,—but what is more necessary, examine their excretions. Lithic acid today plays one of the most important parts in all chronic surgery. Who is it that goes into a case of surgery without examining the urine? Again take the condition, this diathesis, I do not care whether you call it gout or rheumatism, whether you find it octo-hedral, dumbell, or what you may find it resembles. in the words rheumatism and gout you have a distinction without a difference,—that is what I mean,—practically, both due to malassimilation. Let us go to our ordinary hobby, appendicitis. How many cases of appendicular trouble there are catarrhal in character! What are they due to? Ask yourself the question. I see gentlemen here who have operated time and again. For what? Catarrhal appendicitis. Your humble servant has been the subject of several attacks of appendicitis, there is no doubt about it, but I am still on hand and expect to stay with you as long as I

can. I have not been operated upon, but I would give a good deal if I had my appendix in a bottle. The bane of the American people today is what? Lithic acid. The Englishman has gotten rid of this to some extent, because when he feeds in the morning he takes an hour and a half for breakfast, two hours and a quarter for his lunch and six hours for his dinner. (Laughter and applause). He chews on each morsel thirty-two times. He gets plenty of saliva mixed with his food so that it can commence the digestive process at once; he uses phosphate of soda at his club plenty of it instead of sodium chloride with his food. We swallow our morsel today and promise to chew it tomorrow. Whether it is in the army, the navy or in private citizenship we merely down a little bit of breakfast, we allow ourselves ten minutes for lunch and then go to dinner for half an hour. That is the size of the American man. That is the business man, that is the army, that is the navy, that is everybody. I do not know so much about the navy; it is my opinion that there they can sit down to eat, but the rest of us can't. Lithic acid diathesis and lithiasis will show up frequently soon after operative interference. It has its influence after your operation. If you have not observed it, you will notice it after you have opened a man's abdomen. Again this has not been noticed only by one or two, this habit of ours of swallowing a bolus, a mass or what you may call it, like the cow forming her cud today and chewing it tomorrow. It shows itself, and all of you who do operations have noticed it. I see our friend Dr. Marcy of Boston here, who has done more hernia work than any man I know of. I see the father of the American Medical Association here, Brother Didama, [applause] and he will tell you the same thing, as will Maj. Halley of Missouri, Col. Priestley of Iowa, and Gen. Blood of Massachusetts. Even our old friend and brother Gen. Byers of Wisconsin will tell you this is true. Again, what does this lead up to? The fact is that every one of us breathes in bacilli, it may be a tubercular bacillus, with an imperfect mucous membrane laying us wide open for any infection.

II. Again, (and now, gentlemen, I guess I am going to throw a red rag) the use of normal salt solution is questionable in any condition where the heart is unsatisfactory by reason of shock. In other words labor should not be added to this already weakened organ except for the loss of blood, actual loss of blood. Where there is a loss of blood giving rise to any depression of the pulse then it is you can afford to fill up your vessels and force more work on this central organ when under an anaesthetic. Even this is a questionable problem today. Your humble servant has been in a position where he has seen two patients go over the road by reason of the injection of a normal salt solution. I am here like the rest of you for the purpose of learning something, and I am just telling you a little of my own experience. .

III. There is another thing which comes up in the army and navy which I want to speak of in just a few words. What has the medical profession done in the way of treatment of gonorrhea? "Where are we at?" That is what I mean. Let me ask you, what have we accomplished in this line? What are you going to do? What can you do? Remember that this is an evil that is with us and has come to stay. The Lord only knows where it came from, but I will tell you right now that it is one of the hardest things to deal with I have ever met in surgery. Take the sequel of this trouble, gonorrheal rheumatism. What are you going to do for it? How are you going to cure it? This is important to us who used to belong to the army and are ready to go again when necessity calls us. How do you cure it? What is the specific? I have now under observation at home two cases of gonorrheal rheumatism, and let me say to you that my experience is simply this: They come around for treatment, they get tired of you after a while, they see you cannot cure them and then they go to some other fellow and finally some Christian Scientist gets after them, and then when the trouble naturally subsides and goes out itself, we get blamed for not having cured it. There is no doubt about that. I am not going to weary you, but I just want to throw these things out for your discussion.

IV. There is an instrument made now to which I want to call your attention, you gentlemen of the army and navy and national guard, and that is Dr. Lee's instrument for closing intestinal perforations in gunshot wounds and other wounds of the abdomen where you are satisfied that you have perforation of the intestines. I am sorry, indeed, that I have it not here with me, but I expected to have it and I also expected Mr. Truax to bring one with him. Again, gentlemen, this instrument I speak of keeps out the assistant's hands from the abdominal cavity. You do not have to do as you do in Dr. Laplace's method or any other, or have an extra pair of hands to assist you. I speak of this as a great assistant particularly in the field where you are apt to be short handed.

V. There is another thing in the territory of surgery I want to call your attention to, and that is tendon surgery. The approximation of tendons, the uniting of tendons and of muscles. Now I want you to distinctly understand that in the trial with the muscles you are going to fail, but if you unite the tendons you will not have any trouble with them. In other words, if you have a muscle that is active get its tendons united to one that is necessary and it will rapidly develop for the purpose that you want it.

VI. I want to call your attention to another subject, and that is gloves. The rubber glove has come to stay, and wherever you want to use or make or do aseptic surgery use the rubber glove. It is now what might be called a necessity, the same as ice is a necessity, not a luxury. Wherever you are dealing with anything like a serous cavity, one that requires operative interference use the rubber glove, because a good rubber glove can be boiled and reboiled. Use it. You may reply at once that it will impair the tactile sense. It is not so. You have got to accustom yourself to the use of the rubber glove and in two months your tactile sensation is just as good as it is without. You can use the needle and you can use the knife. You can use the hemostat just as easily with the rubber glove as without it. All you have to do is to edu-

cate yourself to its use. It has come to stay, there is no doubt about it.

VII. Again the army surgeon may be placed in a position, especially in the field, where he may need an aseptic needle. I do not mean an antiseptic needle, but an aseptic needle and ligature or suture. Today you have it under your control. The needle already threaded comes to you from the very largest you have to use in hernia down to the smallest that you can use in your work. A needle two and one-half inches long you can get already threaded with large sized catgut, chromicized or otherwise, just as you want it. These needles have come to stay.

VIII. Let me say there is a subject that has been harped upon ever since Adam was born, (although I believe he was not born, "jest growed") and that is the use of the catheter. The catheter that is now used is one that you can boil. A catheter nowadays is so cheap that you only use it once. Is not that a fact? The rubber catheter is one of those things that have come to stay. But let me say, gentlemen, let me call you attention to one fact: test every one of them. I will show you a specimen of a catheter in this vial [indicating] the end of which was in a bladder three years. It is surrounded by a deposit of stone. We are all natural cowards. Be honest with yourself. In other words, don't let a man get away, if you have lost the end of your catheter, without telling him so. It is easy enough to test a catheter when you use one of rubber. This is the kind of catheter that is now most generally used. [Exhibiting soft catheter].

IX. The use of inhalation of oxygen instead of chloroform in convulsions, uremic or otherwise, even in eclampsia, is another thing that has come to stay, and the anesthesia to the central organs is perfectly wonderful. You all know how easily you can confine a little oxygen until you want it.

X. Now I will not detain you any longer, but I just want to call your attention to the fact that in army, navy and general medical practice the future of medicine and surgery depends upon the "survival of the fittest".

DISCUSSION.

COL. W. W. GRANT, Colo.—The General says he expects to throw out a red rag in reference to transfusion. I do not think he treats this question right to report two fatal cases without a history of those cases. The profession does not now have a case of weak heart without giving a normal salt solution. If you cannot fight the trouble by the use of normal salt solution I do not see how you can render any more direct service by any other means, although at times those channels are not sufficient. I believe it to be the consensus of opinion of the best physicians in the world that the saline infusion is the most valuable aid that we have today.

COL. R. H. REED, Wyo.—I cannot but commend the very valuable paper presented by our friend Gen. Griffith. It was full of meat, full of thought, full of practical points, and yet with all respect for our friend from Kansas City I feel that there are some points in the paper from which I differ and which are worthy of notice at least.

I shall not differ with the General in his paper in reference to gonorrhea. We are all aware that, with all the advantages afforded by bacteriological research and the advancement of therapeutics, we stand as far behind in the matter of successful treatment of gonorrhea today as we did one hundred years ago. Think of it! It runs its course, it is followed by stricture, by rheumatism and various other calamities that follow in the train of these troubles, and we are unable to cope with it today. It is a lamentable fact. We ought to get to the point where we can handle it the same as diptheria is treated with antitoxin; we have not reached that point yet, but it is to be hoped that some member of this Association will reach it and give us something in the future that will accomplish the same result.

A question I have to take issue with is in reference to the use of the rubber glove. I know I am antagonizing a popular fad, a fad that is popular throughout the United States with the best surgeons, but, gentlemen, I was taught when a child that "a cat with gloves catches no mice." I am satisfied that the operator who uses the rubber glove can do no better work than the operator without the rubber glove provided the operator without the rubber glove uses ordinary surgical cleanliness. It is simply a matter of cleanliness after all. You are just as liable to get your glove soiled as your hand. If you clean your hand surgically before an operation you are going to have a clean pair of hands to put into the abdominal cavity

or anywhere else, as clean as the rubber glove; and I know to an absolute certainty after trying them I got no better results from rubber gloves than from my naked hands, and in addition to that the tactile sense is better without the glove than with it. Our essayist says we must overcome this. You might as well say cloudy spectacles would give as clear a sight as clean ones. I do not believe the rubber glove has come to stay. I know several good surgeons, who have used the rubber glove for a considerable time, and are discarding it, for the simple reason that they are getting no better results, and for another reason that they do not have the necessary tactile sense for making an operation in the abdominal cavity. Take the difficult operation of implanting the ureter in the rectum and use the rubber glove. You cannot handle the needle, you cannot handle your instrument; and right here is a point to which I want to call your attention: Never use a needle holder if you can handle it by using your fingers. I saw a gentleman operate a few days ago who used a needle holder for the purpose of doing the most simple suturing. Do it with your naked fingers; they are better than the best needle holder you can get. I frequently have young railroad surgeons come to me and ask what kind of splints they should use. I say to them every time, get your own splints. If you have not the surgical knowledge, if you have not the ability at any time to handle a fracture or any part of a surgical operation in a way that may be suggested by your own mechanical ingenuity, do not go into the field of surgery. So I say in the field of instruments use your own common sense, but use as few instruments as possible and use them as little as possible.

Another point brought out in the speaker's remarks was the use of needles and catgut put up in bottles. Do you know whether such material is aseptic or not. No, you have no way of knowing whether it is aseptic or not. The manufacturer is not interested in the operation in which life or death is concerned. Not a bit of it. He is making the needle and the catgut to sell, but you are using them to save your reputation and the life of your patient. I prefer to prepare my own needles and catgut to any that are prepared in the United States or any other place. I have used these needles and used the catgut and have been disappointed in them. It is perhaps more convenient and cheaper to use those needles and the catgut than to prepare them yourself, but where you have trained yourself to use good ones you do not want to use anything else, and I am opposed to the use of catgut and needles unless

you positively know they are surgically aseptic or unless you cannot get any other. As to the use of catgut, there is no question but that catgut properly prepared, made aseptic, is much superior to any other suture material, unless it is our friend Marcy's kangaroo tail. The secret is to have everything absolutely clean, and the same secret lies in the use of the gloves and the naked hand. Take Tait, didn't he show to the world that cleanliness was the secret of his success? He hated an antiseptic surgeon, and yet he left us a pretty good record. We have many others who claim that antiseptic surgery is not the secret of success, but that the secret lies in cleanliness, and they have made good records.

LIEUT. COL. HENRY O. MARCY, Mass.—I am deeply interested in the question brought up by the last speaker. Some of you know something of the early history of antiseptic surgery. I shall only refer to the fact of Mr. Keith showing the sponges cared for by his wife, and of which he says that he had done more than one hundred laparotomies and used only those sponges. You know that there is no operator that stands higher than Mr. Keith of Edinburg. His record stands almost unsurpassed. The secret of his success is the care exercised in his technique. Mr. Tait I knew well, and we often had a little *tete-a-tete* over these matters. I think he was a false teacher for many reasons, especially, when we consider the principles of bacteriology and infection, yet he did leave us a lesson in the care and cleanliness which he exercised, and I believe I learned much in studying the record of Mr. Tait in abdominal surgery.

As to my own record of 600 operations of a major type, I show two per cent of infectious wounds and that without the use of rubber gloves. I think the last speaker referred to the use of rubber gloves. For the last two years in all of my operative work I have used the rubber glove, and I think the only consideration in using them is that I feel a little safer, although I rather agree with the speaker that the technique is not so good as before I used the rubber glove. The tactile sense is something that must be acquired and I do not see how we can help acquiring it. There are different kind of gloves and there are different ways in which they may be prepared, and it is not always certain that the manufacturer can give us a uniform result. All of us who know the danger of infection of the epithelium must acknowledge the risk and danger to the patient from the operator's hands. Every other place can be reasonably well protected. There are a good

many surgeons who do not agree on that epithelial protection. I think the use of the gloves makes an operation safer.

I disagree with the doctor when he says that muscle suturing does not unite with the tendon, because I believe if the operation is properly done there will be no difficulty in that direction.

BRIG. GEN. J. D. GRIFFITH, Mo. [*Closing discussion*].— I have nothing to say except to reply briefly to Colonel Reed. I simply want to ask him how he can keep the sweat glands of the face clean? How long and how often does he clean his nails, and how does he know that his assistants observe all those things?

I once more say that the rubber glove has come to stay and I see no reason for changing my opinion. Again, Mr. President, I want to say about this glove, you can boil it as long as you please. If there is anything in Mr. Tait's whole experience of teaching it lies in this fact of cleanliness. I don't care how dirty the water looks, boil it. There are not many bugs that live more than twenty minutes at a temperature of 212 degrees. Put your ligature into it. When it comes to this union I am sorry to say I have opened several abdomens. I have done a little celiotomy, laparotomy, etc., and I have not been as fortunate as I might have wished although I used a suture in different lines. I have used several lines of sutures in trying to approximate tissue. I have had some hernias. With regard to this subject of bacteriological work I can say again as I said before, I believe that this is a survival of the fittest and it lies in the future, what we have to do. It is the survival of the fittest.



Editorial Department.

THE NEW DEPARTURE.

THE publication of a journal, devoted to military medicine, surgery and sanitation, under the auspices of the Association of Military Surgeons of the United States has long been a cherished project of many of the more active members of the Association. Propositions looking toward that end, have, however, from time to time been laid aside as inexpedient or untimely. The value to the Association of such a publication has never been denied, but hitherto one or more of the factors essential to success has apparently been lacking whenever the subject has arisen for consideration. This condition prevailed up to so recent a period as the last annual meeting of the Association, but shortly after its adjournment the way for the inauguration of periodical publication opened up so clearly that, by the unanimous vote of the Executive Committee, it was determined to enter at once upon the journalization so long anticipated. The present number is the outcome of this decision.

This issue, the initial publication in journal form, consists of the proceedings and papers of the St. Paul meeting, the brevity of the program on that occasion rendering it possible to include all the exercises in a single number. Future issues, however, will conform more closely to journalism of the more conventional type.

The Journal will be published quarterly during the present Association year, but arrangements are in preparation by which it will be possible to issue it monthly thereafter. The contents of the remaining numbers for the year 1901-1902 will consist of original memoirs, reprints, translations and ab-

tracts, together with some editorial comment in various forms, all pertaining to the domain occupied by the Association. Much attention will be paid to inventions and advances along medico-military lines, and the personal phase of medico-military service will receive special consideration.

The aim of the Journal, like that of the Association of which it is the offspring, will be to fulfill its logical mission of encouraging the development of military medicine, of inspiring progress in military surgery, of fostering growth in military sanitation, of adding to the effectiveness and influence of the military medical officer, and of increasing the efficiency of the Association in the accomplishment of its declared purpose "to promote and improve the science of Military Surgery."

THE ENNO SANDER PRIZE.

SPECIAL encouragement is hardly necessary to excite interest in the question of the organization of the medical department of the army in active hostilities. The Spanish war and its corollary the hostilities in the Philippines are too recent for the struggles of the medical department in the endeavor to obtain suitable facilities for the care of the disabled to be forgotten. The storm of undeserved criticism which beat upon the medical officers in their masterly and ultimately successful efforts to afford to the sick and wounded the best possible care, is too fresh in the memory of its victims to necessitate much urging for them to speak freely upon a subject which so deeply interests them.

The choice then of the subject for the Enno Sander prize contest this year is a peculiarly happy one, not only on account of its intrinsic value to the profession of arms and the science of medicine, but because of the absorbing interest felt

in the subject by so many intelligent and accomplished officers who have been both practically and theoretically employed in the efforts to solve the problem.

While perhaps the truly scientific spirit needs no incentive other than the good he may accomplish, yet it is to be hoped that the generous consent of Major Sander to double the amount of the prize this year may afford to possible competitors at least an indication of the high estimate in which the subject is held and prove both a moral and practical stimulus to the highest grade of work in connection with the competition.

THE LITERARY PROGRAM FOR THE ELEVENTH ANNUAL MEETING.

THE LITERARY COMMITTEE of the Association is meeting with encouraging success in its work of preparation for the next meeting and a number of valuable and interesting papers have already been promised. It is hoped that those who intend to write will not delay, lest the pressure of other duties may at the last interfere entirely. Papers that come in early and are of immediate interest, will, if possible, be published in the Journal before the next meeting.

The Committee is particularly desirous of contributions from members who are or have been in active service abroad. Very little has as yet appeared in our Proceedings illustrative of the work of medical officers in Cuba, Porto Rico, the Philippines or China and the omission ought to be supplied, while memory of the events is fresh.

The Committee may not be able to reach by personal letter some who are prepared to write, and trusts they will not wait, but send in at once the subject chosen, to the Chairman of the Committee, Colonel C. H. Alden, U.S.A., Retired, Newtonville, Mass.

THE PERSONAL RECORD.

DURING the Summer, blanks have been distributed throughout the Association as the foundation for a personal record of the membership. These blanks, when received, are arranged after the card catalogue style in suitable file cases and constitute a biographical work of the highest value. There are still a few members who have not returned their blanks, and a few who failed to enclose a photograph with the record. These members are urged to complete the forms without delay.

THE WASHINGTON MEETING.

THE selection of Washington as the location of the eleventh annual meeting and the 5th, 6th and 7th of June next as the date of convening, insures a successful meeting from every point of view. The arrangements are already taking tangible shape, and at an early date, it will be possible to make some definite announcements with regard to them.



Topographical List of Members.

THIS list is arranged alphabetically primarily by States and services, and secondarily by post-offices. The names of those members residing in the same place are again arranged alphabetically. The names of Associate, Corresponding and Honorary Members are in italics.

ALABAMA.

Lieut. Angelo Festorazzi,
153 Government St., Mobile, Ala.
Capt. Lewis Coleman Morris
Chalifaux Bldg., Birmingham, Ala.

ARIZONA.

Capt. Dennis J. Brannen,
Flagstaff, Ariz.
Col. Harrison Edward Stroud,
Phoenix, Ariz.
Col. Winfred Wylie,
Phoenix, Ariz.

ARKANSAS.

Col. James McDonald Keller,
Hot Springs, Ark.

ARMY.

Col. Charles Page, U.S.A.,
340 Dolphin St., Baltimore, Md.
Major James Evelyn Pilcher, U.S.V.,
259 W. Pomfret St., Carlisle, Pa.
Gen. Robert Murray, U.S.A.,
Castle Creek, Hot Springs, Ariz.
Major John O. Skinner, U.S.A.,
Chambersburg, Pa.
Major Henry I. Raymond, U.S.A.,
Pullman Bldg., Chicago, Ill.
Col. B. J. D. Irwin, U.S.A.,
Cobourg, Ontario.
Cont. Surg. S. S. Wilcox, U.S.A.,
173 E. State St., Columbus, Ohio.
Major William C. Shannon, U.S.A.,
Elkhorn, Neb.
Lieut. W. P. Chamberlain, U. S. A.,
Fort Adams, Newport, R. I.

Cont. Surg. W. E. Sabin, U.S.A.,
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Fort Bayard, New Mexico.
Cont. Surg. Joseph R. Harmer, U.S.A.,
Fort Fremont, via Beaufort, S. C.
Cont. Surg. Henri A. Santoire, U.S.A.,
Fort Greble, Jamestown, R. I.
Lieut. Col. Ezra Woodruff, U.S.A.,
Fort Hamilton, N. Y.
Cont. Surg. A. I. Boyer, U.S.A.,
Fort Lawton, Seattle, Wash.
Major Charles Richard, U.S.A.,
Fort Leavenworth, Kan.
Capt. William H. Wilson, U.S.A.,
Fort McDowell, Cal.
Cont. Surg. F. A. Hodson, U.S.A.,
Fort Mackenzie, Sheridan, Wyo.
Capt. George J. Newgarden, U.S.A.,
Fort Mason, Cal.
Lieut. Robert Smart,
Fort Monroe, Va.
Cont. Surg., J. W. Richards, U.S.A.,
Fort Mott, Salem, N. J.
Cont. Surg. O. H. Buford, U.S.A.,
Fort St. Philip, La.
Major Charles F. Mason, U.S.A.,
Fort Sam Houston, San Antonio, Texas.
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Major Francis J. Ives, U.S.A.,
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- Major Alfred E. Bradley, U.S.A.,
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- Cont. Surg. Herbert I. Harris, U.S.A.,
Fort Snelling, Minn.
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Fort Robinson, Neb.
- Capt. William H. Block, U.S.V.,
Medical Supply Depot, Havana, Cuba.
- Lieut. Col. Valery Havard, U.S.A.,
Havana, Cuba.
- Capt. Deane C. Howard, U.S.A.,
Havana, Cuba.
- Lt. Col. Jefferson R. Kean, U.S.A.,
Havana, Cuba.
- Major M. C. Wyeth, U.S.A.,
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- Major Henry P. Birmingham, U.S.A.,
Manila, P. I.
- Capt. Robert Boyd, U.S.V.,
Manila, P. I.
- Maj. W. F. de Niedman, U.S.V.,
Manila, P. I.
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Manila, P. I.
- Major Edwin F. Gardner, U.S.A.,
Manila, P. I.
- Capt. Guy C. M. Godfrey, U.S.A.,
Manila, P. I.
- Major Henry S. T. Harris, U.S.A.,
Manila, P. I.
- Lieut. Col. Philip Francis Harvey, U.S.A.,
Manila, P. I.
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Manila, P. I.
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Manila, P. I.
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Manila, P. I.
- Lieut. Col. Louis M. Maus, U.S.A.,
Manila, P. I.
- Major William O. Owen, U.S.A.,
Manila, P. I.
- Capt. Henry du R. Phelan, U.S.V.,
Manila, P. I.
- Major John L. Phillips, U.S.A.,
Manila, P. I.
- Lieut. Col. Benjamin F. Pope, U.S.A.,
Manila, P. I.
- Lieut. Thomas L. Rhoads, U.S.A.,
Manila, P. I.
- Major William Stephenson, U.S.A.,
Manila, P. I.
- Capt. Henry R. Stiles, U.S.A.,
Manila, P. I.
- Major William J. Wakeman, U.S.A.,
Manila, P. I.
- Major Charles Wilcox, U.S.V.,
Manila, P. I.
- Major James S. Wilson, U.S.V.,
Manila, P. I.
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- Maj. Henry S. Kilbourne, U.S.A.,
Presidio, San Francisco, Cal.

- Capt. William E. Purviance, U.S.A.,
 Presidio, San Francisco, Cal.
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 Cont. Surg. F. A. Halliday, U.S.A.,
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 Care War Dept., Washington, D. C.
 Major Guy L. Edie, U.S.A.,
 Care War Dept., Washington, D. C.
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 Cont. Surg. J. Reagles, U.S.A.,
 Care Surg. Gen., Washington, D. C.
 Major Walter Reed, U.S.A.,
 Surg. Gen. Office, Washington, D. C.
 Lieut. I. A. Shimer, U.S.A.,
 Care Surg. Gen., Washington, D. C.
 Col. Charles Smart, U.S.A.,
 2017 Hillyer Pl., Washington, D. C.
 Gen. George M. Sternberg, U.S.A.,
 Washington, D. C.
 Lieut. Richard P. Strong, U.S.A.,
 Care Surg. Gen., Washington, D. C.
 Lieut. Col. William E. Waters, U.S.A.,
 Care Surg. Gen., Washington, D. C.
 Major Marshall W. Wood, U.S.A.,
 Care Surg. Gen., Washington, D. C.
 Major William C. Borden, U.S.A.,
 Washington Barracks, D. C.
 Capt. F. P. Reynolds, U.S.A.,
 Washington Barracks, D. C.
 Major William L. Kneidler, U.S.A.,
 West Point, N. Y.

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 Col. Winslow Anderson,
 1025 Sutter St., San Francisco, Cal.
 Col. William D. McCarthy,
 111 Eddy St., San Francisco, Cal.
Mrs. John F. Merrill,
 San Francisco, Cal.
 Lieut. Col. George F. Hanson,
 3534 Mission St., San Francisco, Cal.
 Col. William Evelyn Hopkins,
 803 Sutter St., San Francisco, Cal.
Major William F. Southard,
 1220 Sutter St., San Francisco, Cal.
Col. William J. Younger,
 200 Stockton St., San Francisco, Cal.

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 Pueblo, Colo.
 Lieut. E. Hamilton Fish,
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 Col. William W. Grant,
 Denver, Colo.

Lieut. Robert K. Hutchings,
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31 N. Ninth St., Allentown, Pa.
Lieut. John L. Brubaker,
1224 4th Ave., Altoona, Pa.
Major Andrew S. Stayer,
1501 7th Ave., Altoona, Pa.
Lieut. Herbert A. Arnold,
Ardmore, Pa.
Capt. John W. Coffin,
Beaver Falls, Pa.
Lieut. Robert G. H. Hayes,
11 Spring St., Bellefonte, Pa.

Major James Johnston,
Bradford, Pa.
Capt. Louis P. McCormick,
Connellsville, Pa.
Major James E. Silliman,
137 W. 8th St., Erie, Pa.
Major John William Wright,
18 E. 8th St., Erie, Pa.
Major Herman Burgin,
Germantown, Pa.
Major George F. Potteiger,
Hamburg, Pa.
Dr. Harry Ernshaw Gettier,
Littlestown, Pa.
Lieut. John M. B. Ward,
Quarantine Station, Marcus Hook, Pa.
Major Ralph W. Montelius,
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Lieut. Col. Joseph K. Weaver,
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Lieut. William M. Angney,
423 S. 15th St., Philadelphia, Pa.
Major W. H. Baker,
1610 Summer St., Philadelphia, Pa.
Major John H. Brinton,
1423 Spruce St., Philadelphia, Pa.
Dr William Williams Keen,
1729 Chestnut St., Philadelphia, Pa.
Major Edward Martin,
415 S. 15th St., Philadelphia, Pa.
Lieut. Henry Morris,
313 S. 16th St., Philadelphia, Pa.
Major J. Wilks O'Neill,
2110 Spruce St., Philadelphia, Pa.
Col. John V. Shoemaker,
1519 Walnut St., Philadelphia, Pa.
Major Archibald G. Thomson,
1426 Walnut St., Philadelphia, Pa.
Major Charles Smith Turnbull,
1935 Chestnut St., Philadelphia, Pa.
Major Joseph K. T. Van Pelt,
1529 Spruce St., Philadelphia, Pa.
Lieut. Karl A. Emmerling,
48 S. Rebecca St., Pittsburg, Pa.
Lieut. Col. Alexander A. E. McCandless,
Pittsburg, Pa.
Major Samuel C. Milligan,
609 Smith Block, Pittsburg, Pa.

Lieut. B. Stewart Ralston,
Penn Ave., and Main St., Pittsburg, Pa.

Lieut. Edward Stieren,
219 6th St., Pittsburg, Pa.

Major William J. Ashenfelter,
Pottstown, Pa.

Major George H. Halberstadt,
218 Market St., Pottsville, Pa.

Major William McC. Johnston,
Sewickley, Pa.

Lieut. Jacob Mark Peters,
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Lieut. Francis E. Drumheller,
Sunbury, Pa.

Lieut. Charles H. Miner,
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Major Walter S. Stewart,
52 S. Franklin St., Wilkesbarre, Pa.

Major J. Lewis Srodes,
742 Penna. Ave., Wilkesburg, Pa.

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32 Bull St., Newport, R. I.

Lieut. Charles M. Cole,
250 Broadway, Newport, R. I.

Lieut. Col. Charles H. French,
109 Broadway, Pawtucket, R. I.

Major Charles F. Sweet,
38 N. Union St., Pawtucket, R. I.

Lieut. James L. Wheaton,
Summer St., Pawtucket, R. I.

Gen. John C. Budlong,
604 Westminster St., Providence, R. I.

Lt. Col. George W. Carr,
27 Waterman St., Providence, R. I.

Capt. George H. Crooker,
159 1/2 Benefit St., Providence, R. I.

Maj. Frank L. Day,
240 Benefit St., Providence, R. I.

Major N. D. Harvey,
260 Benefit St., Providence, R. I.

Gen. George H. Kenyon,
123 N. Main St., Providence, R. I.

Major William J. McCaw,
222 Benefit St., Providence, R. I.

Lieut. Charles F. Peckham,
176 Benefit St., Providence, R. I.

Lieut. William Francis Barry,
Woonsocket, R. I.

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1309 Plain St., Columbia, S. C.

SOUTH DAKOTA.

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Arizpe, Sonora, Mexico.

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Spearfish, S. Dak.

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415 Atlas Bldg., Salt Lake City, Utah,

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Salt Lake City, Utah.

VERMONT.

Major George C. Berkley,
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Gen. James N. Jenne,
130 Main St., St. Albans, Vt.

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Winooski, Vt.

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Capt. Charles Venable Carrington,
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Major Dirk A. Kuyk,
4 W. Grace St., Richmond, Va.

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402 Bailey Building, Seattle, Wash.

Col. James B. Eagleson,
512 Burke Bldg., Seattle, Wash.

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Major Edward H. Grannis,
Menominee, Dunn Co., Wis.
Capt. Ralph Chandler,
13 Grand Ave., Milwaukee, Wis.
Capt. William J. Cronyn,
245 14th St., Milwaukee, Wis.
Major John R. McDill, U.S.V.,
200 Wisconsin St., Milwaukee, Wis.
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- Surg. Lieut. Col. J. L. H. Neilson*,
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Surg. Lt. Col. George Sterling Ryerson,
60 College St., Toronto, Canada.
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28 Rodney St., Liverpool, England,
Surg. Col. William McWatters,
Care Holt & Co., 3 Whitehall Place,
London, England.
Sir J. O'Neill, C. B.,
Surg. Gen. (Ret.), Indian Med. Service,
London, England.
Surgeon Captain Rory Fletcher,
Care Capt. A. K. Fletcher, Hillcroome,
Sutton, Surrey, England.
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Bergmann*,
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*Excellenz Generalarzt Prof. Dr. Fr.
von Esmarch*,
Kiel, Germany.
*Excellenz Generalarzt, Dr. Eduard
von Fichte*,
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Lt. Commander Dr. Tomat Suri,
Surgeon, Imperial Japanese Navy,
Tokyo, Japan.
General Epifanio Cacho,
General Jefe del Cuerpo Medico, Militar,
Mexicano,
Ciudad Mexico, Mexico.
Coronel Fernando Lopez,
Coronel Medico Ciruj., Director Hosp.
de Mexico,
Ciudad Mexico, Mexico.
Tente Cor. Zacarias R. Molina,
Cuerpo Medico Militar Mexicano,
Vera Cruz, Mexico.
Major Narciso del Rio,
Cuerpo Medico Militar Mexicano,
Vera Cruz, Mexico.
Captain Hans Daal,
Sanitary Captain, Norwegian Army,
Christiania, Norway,
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University of Norway,
Christiania, Norway,

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 Christiania, Norway.
- Dr. Adolph Alexandrovitch Remert,* *Dr. Karl Rudberg,*
 Inspecteur général de service de santé Staff Surgeon Swedish Navy.
 militaire, Inginernaia and Bolchaia Stockholm, Sweden.
 Sadovaia Streets,
 St. Petersburg, Russia.
- Colonel Adolf Ziegler,*
General Thien Ho, Médecin en chef de l'armée fédérale Suisse,
 Med. Inspector General Siamese Army, Departement militaire.
 Bangkok, Siam. Berne, Switzerland.





Original Memoirs.

A MANILA MILITARY HOSPITAL.*

By JOHN S. KULP, M. D.

NEW YORK CITY.

CAPTAIN MEDICAL DEPARTMENT, U. S. ARMY; MAJOR AND
SURGEON OF UNITED STATES VOLUNTEERS.

IN THE Spring of 1899 there was need of another hospital in Manila, and permission was obtained to establish "Supplementary Wards." Circumstances beyond the control of the Medical Department, and which I am not at liberty to explain, made it necessary that the number of medical officers and men should be the smallest consistent with supplying ordinary service to the sick. The place allotted was a dilapidated Spanish Barracks surrounded by filthy moats, but in an excellent location. One of the most able and energetic officers of the corps was placed in command and given two assistants, of which I was one†. The idea from the onset was the establishment of a military institution, rather than a hospital managed on the lines of civil institutions by a more or less military personnel. The reasons for this were (*a*) the economy of labor necessary, (*b*) the advantage of thorough discipline, (*c*) the utilization of the institution for instruction, and (*d*) because it was believed that the systematic control available in military organizations insured the highest efficiency.

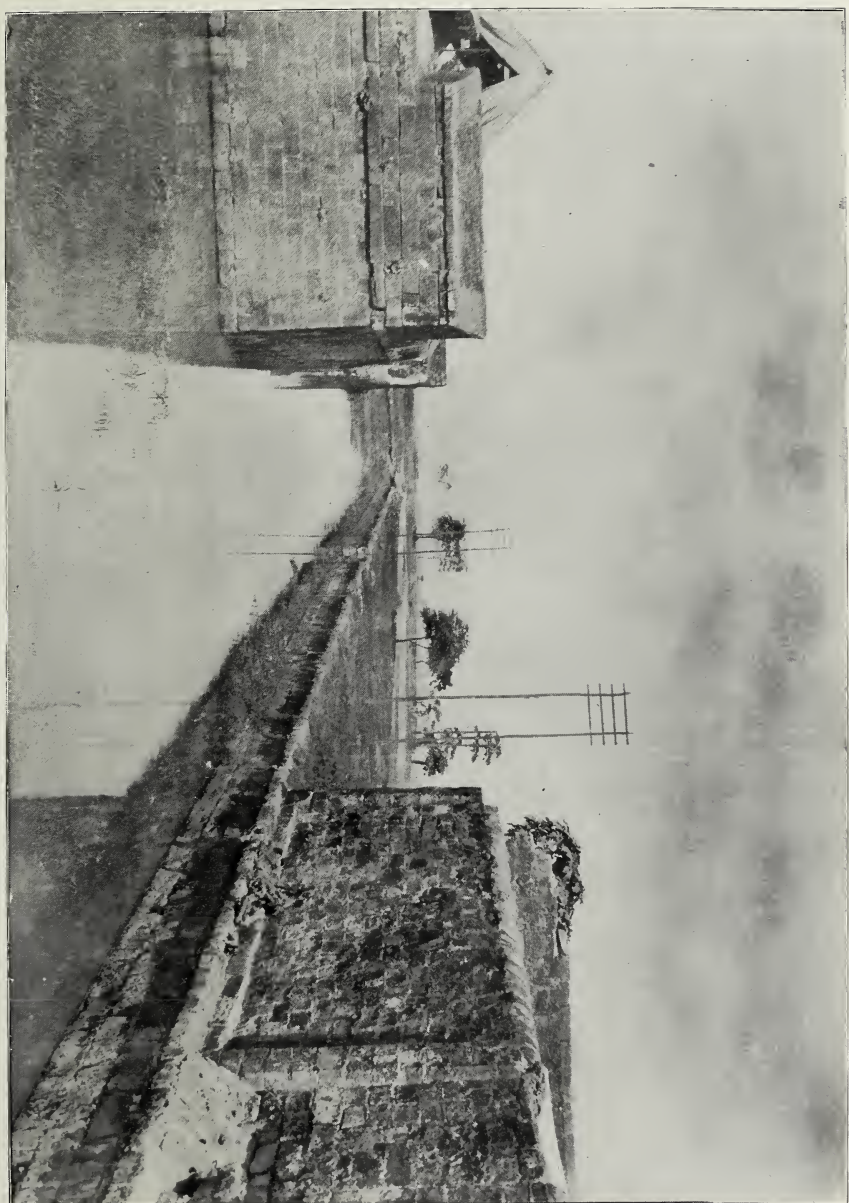
The situation was on the Paseo de Aguadas near the bay and adjoining the Luneta, a part of whose ancient fortifica-

*In complying with the JOURNAL's request for an article on this subject I have used unsparingly several official reports for which I am indebted to the courtesy of the Surgeon General.

†Captain Kulp succeeded Major Kendall in August 1899, and remained in command until May, 1901.




MOAT AND WALLS SURROUNDING HOSPITAL THREE BEFORE IT WAS USED BY THE MEDICAL DEPARTMENT.



MOAT AND WALLS SURROUNDING HOSPITAL THREE AFTER OCCUPATION BY THE MEDICAL DEPARTMENT.

tions are about the post. Many years ago Manila's first military hospital was built on this spot and was destroyed by an earthquake. From its ruins arose the composite stone buildings of the engineer corps, which fell during the all-night convulsion of 1863, only to be again rebuilt, and again destroyed by the short violent upheaval of July, 1880. The ground was then graded and the present buildings begun so that in January, 1881 they were ready for occupancy. Even then the engineers had no rest. At the first inspection, the inspecting officer seeing that the new barracks were superior to those of his own troops, (the Cuartel Meisic) ordered a transfer. The incoming regiment was the famous 73rd Cazadores, or Huntsmen, composed of native Visayans officered by Spaniards. This regiment, about eight hundred strong, occupied the barracks until the investment by our troops on 13th August, 1898, after which they were occupied successively by California, Pennsylvania, and Kansas volunteers.

The institution then consisted of seven large wooden buildings, each having a single story elevated three feet above the ground. The ceilings were high and the ventilation practically perfect. The general plan was that of a triangle attached to a square: . Around the sides of the square were the six wards each having an average capacity of forty-eight beds, while occupying the two outside arms of the triangle were the baths, laundry, main kitchen, paring room, cold storage, carpenter and paint shops, commissary, quartermaster and ordnance storerooms, and the commanding officer's quarters. In the administration building, which forms the front of the square were the offices of the commanding officer, officer-of-the day, registrar, and dentist as well as the laboratory, consultation room, medical storeroom, dispensary, baggage room, printing office, and linen room. Ward F, (acute surgical) which is also in this building, communicates directly with both operating and dressing rooms. The floor space is about three-fourths of an acre.

Since their occupation by the medical department all buildings have been reroofed and painted, complete cement

walks have been built and many parts entirely remodeled. The post (Hospital Three)* of which the hospital formed the most important part, also contained as separate organizations a company of instruction and a casual camp.

PATIENTS—The bed capacity of the hospital was 297, with 57.5 square feet of floor space, and 1035 cubic feet of air space per bed. As a rule there were few vacancies. Each ward had attached to it rooms for the sanitary soldiers on duty, and for patients' effects. The number of each bed corresponded with that on a locker in general and ward store-



ONE OF THE CORRIDORS OF HOSPITAL THREE.

rooms, as well as on the ward slip and the cards in the office of the registrar. Incoming patients were examined by the officer-of-the-day as soon as received, the diagnosis was made or confirmed whenever practicable, the diet outlined, and any

*Hospital Three was organized 19th January 1900 from the Supplementary Wards without change of personnel or administration. The Hospital Corps Company of Instruction was founded 23rd May, and the Casual Camp 7th June of the same year.

necessary medication prescribed before the man was sent to his ward. Each patient was seen at least twice daily by his ward surgeon, who was responsible for everything pertaining to his ward. A permanent consulting board, consisting of the commanding officer, the officer-of-the-day, and the ward surgeon was called whenever requested by the latter. The laboratory was well equipped for ordinary clinical work, and the pathologist examined blood, faeces, sputum and urine on application of the ward surgeons. A complete record of treatment and of the more important symptoms was kept and filed



LECTURE AND MESS HALL OF CASUAL CAMP, HOSPITAL THREE.

for reference. Meals for convalescents were served in the main dining hall (figure 3) from four regular diet lists, one of which was entirely in the hands of the ward surgeons.

Patients were classified according to their disease or injury, and as all cases of permanent disability in the Philippines were sent to this hospital, (every one of which was that of a possible future pensioner), the work was of more than ordinary responsibility. Up to the end of April of this year

the hospital had treated over 7000 patients, the most common ailments being tropical diarrhoea, dysentery, typhoid and malarial infections, wounds, disorders of digestion and tuberculosis. One case of pestis bubonica developed in a ward containing fifty-three patients but was not communicated to others.

As many of the patients were convalescents especial effort was made to provide for their entertainment by means of band concerts, phonographic entertainments, drives about the city, river and bay trips on the launch *New York*, and a well selected library of about seven hundred volumes.



MAIN DINING HALL OF HOSPITAL THREE, SEATING 340.

ADMINISTRATION.—The administration was conducted on a system of divided responsibility, (it might be termed a "block system") as each head of a department was given as complete autonomy as possible without nagging interference so long as his work was efficient and showed steady improvement. The head of a department represented the commanding officer so far as his subordinates were concerned, and was made to feel that a personal interest was taken in his indi-

vidual record and progress. In such a system there is no loss of authority or dignity to the military head, but there is a division of responsibility which is strictly in line with specialized up-to-date "automatic" methods. The man who uses men's heads to advantage is a better administrator than he who uses merely their hands, and most unfortunate is the military command whose head is a slave to detail. Frequent personal inspections, both official and informal, kept the commanding officer, the officers-of-the-day, and the superintendent in close touch with subordinates whose suggestions in regard to their own work were treated with respect and often were of value. It is not what the inspector sees, but what the subordinate thinks he sees, or fears he may see, that gives value to inspections, while judicious approbation is a power in itself. The orders of the post were embodied in a so-called Circular of Information, a copy of which was issued to each man by the executive officer, and he was required to enter new orders whenever issued.

PERSONNEL.—The personnel was officers 6, noncommissioned officers 10, privates 60, native laborers 11, a total of 87. Percentage of personnel to bed capacity 29.28. The duties of the officers were:

1. Commanding officer.
2. Executive Officer, Summary Court, preparation and correction of certificates of disability.
3. Acting ordnance officer, quartermaster and commissary.
4. Two wards and sick calls.
5. Two wards and operating surgeon.
6. Two wards and pathologist.

The noncommissioned officers had the following duties:

1. Superintendent of Hospital.
2. Provost Sergeant.
3. Registrar.
4. Commissary Sergeant.
5. Pharmacist.
6. Quartermaster Sergeant.

7. Chief Clerk.
8. In charge of operating room.
- 9, and 10 Wardmasters.

Had there been four more noncommissioned officers available they also could have been advantageously detailed in charge of wards.

The Superintendent supervised the executive work of all departments, temporarily filled vacancies in emergencies, acted as first sergeant of the detachment, and (under the executive officer) was responsible for its discipline, attention to duty and appearance. In company with the provost sergeant he reported personally to the commanding officer before the officers-of-the-day and the executive. The advisability of having a noncommissioned officer act as superintendent of a three-hundred bed hospital is, I am aware, open to question. Its advantages are that an old well trained noncommissioned officer is in close touch with the men, and can accomplish much in a tactful advisory way. He was never given any authority which would bring him into antagonism with an officer or a contract surgeon. No officer could be spared for this work, and the experiment was a satisfactory one, although I should hesitate to repeat it—so much depending upon the personality of the man.

The Registrar was responsible for records and correspondence, and had six clerks. With the exception of descriptive lists from the company of instruction, or casual camp of the hospital corps, (for which their own immediate commanders were responsible), he personally inspected every paper entering or leaving the office, and if necessary informally returned for correction those from other departments of the hospital with the data for their alteration. No officer was available for this duty.

Space does not permit of extended description, neither are the details of interest, but it may be stated that the division of office work was as follows:

Chief Clerk, assistant to Registrar, (assuming his duties when necessary), the supervision of cross-references, and preparation of papers relating to the detachment of the hospital corps.

Second Clerk, preparation of the report of sick and wounded, register of patients, and the admission of patients.

Third Clerk, certificates of disability and papers relating to oversea transfer of patients.

Fourth Clerk, assistant to second clerk.

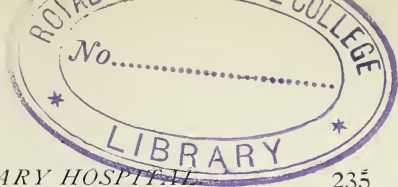
Fifth Clerk, letters sent, letters received, notifications and correspondence relative to admission and discharge of patients.

Sixth Clerk, reception of papers, files of orders, copying, and office orderly.

The general orders for the office were, "The greatest vigilance will be practiced to guard against clerical errors. Names will be verified by having the soldier spell them whenever practicable, all routine returns will be carefully compared, and every list of names checked letter by letter. A record of the clerical errors of each man will be kept by the Registrar for the information of the Commanding Officer. Each clerk will attend to such other duties as may be assigned to him. Each paper will bear an approved mark, or the initial of the clerk preparing it, in addition to the check mark of the Registrar. Each and every communication passing through the office will be regarded as confidential, and no information or papers will be given out except on proper authority."

The work of this hospital was done by soldiers of the hospital corps, every position from that of Superintendent being filled by them, and their work was satisfactory. There were no male or female civilians employed in the buildings, but the police of the grounds was done by eleven native laborers. Considering the class of men which is attracted by the opportunities for education and promotion which the hospital corps now offers, it is believed that the efficiency of a detachment is an index to that of its commander.

INSTRUCTION OF HOSPITAL CORPS.—Second only in importance to the treatment of the sick is the instruction of the hospital corps. This was systematically carried on in four directions. First the whole institution was regarded as a school, and each department as has been said was put in charge of a soldier who was held responsible for its efficiency. His orders were written in the plainest language, verbal orders were avoided, and he was encouraged to systematize the work of his department. Subordinates were promoted to more import-



ant positions as rapidly as their progress permitted. The sanitary soldier of the 20th century has so many and such varied duties that it is considered indispensable that he should see service, not only in field and hospital, but in every department of the latter as well. In the field he shares every danger with his brother of the line, but he is of value *only* in direct proportion to the training he has received in the hospital. If in garrison the hospital corps man is regarded as only an 'attendant', an orderly to the sick, or an assistant to a female nurse, the price of the mistake is paid for by an inefficient sanitary service of the zone of fire, for which duty the sanitary soldier exists and in which place he can have no substitute.

All round hospital experience is best gained by rotation in station, and this change was made once a month so that every man might become acquainted with ward service, food preparation and supply, dispensary work, operating service, office duty, care of animals and so forth. This practice involved much labor on the part of the officers of the institution in order to prevent impairment of its professional service, but the final results are believed to have justified it.

The second form of instruction was by means of lectures or more properly informal didactic instruction, supplemented by questions and answers held five times a week. The course was varied from time to time, and those showing sufficient aptitude and proficiency at the bi-monthly examinations were recommended for promotion.

The third line aimed especially at the inculcation of a spirit of military discipline. As no better method of obtaining exact and unquestioning obedience is known than by drill, the attendance of every man was required. In no part of an army is discipline so necessary as among those who attend the wounded under the fire of the enemy, assist in operations where delay means death, or stand sentinel between a contagious disease and a military command.

Finally there was a form of instruction, not very tangible it is true, but still of moment—the formation of an *esprit de*

corps. With this end in view the men were encouraged to organize an association of their own, their barracks were made as comfortable as possible and furnished with numerous periodicals, interest was taken in their base-ball club, and they were made to understand that their detachment as a military organization merited their pride in its efficiency. By these methods soldierly self respect and a healthy moral tone were obtained, so that when the detachment volunteered to a man to nurse plague, and when at another time one of their number* remained by his patient for hours after receiving what he considered a fatal wound, their officers felt well repaid for their work.

CONCLUSION.—The military hospital differs from the civil in almost every particular of patient, administration, and personnel. Its commanding officer possesses greater authority and graver responsibilities than those of a mere medical superintendent. The technical knowledge of decisions regulations and papers, which is required to protect the interests of the government on the one hand and to prevent injustice to the soldier patient on the other, can be learned from neither book nor school. In no country can there be obtained a higher class of purely professional talent than in our own, but those trained in the specialty of military medicine must be provided in time of peace. This is the work which the gentlemen composing the Association of Military Surgeons are doing, and the reward will come not only in the saving of life, and the prevention of suffering, but by assistance of no mean value when the time comes for the final object for which all armies exist—the test of battle.

*Private Archibald D. Wilson, H. C.

NATIVE TROOPS FOR OUR COLONIAL POSSESSIONS.¹

BY MAJOR LOUIS LIVINGSTON SEAMAN,

NEW YORK CITY.

SURGEON FIRST UNITED STATES VOLUNTEER ENGINEERS.

THE TIME is at hand for the authorities of the United States to decide a military question of the gravest importance, namely, whether our island possessions in the tropics shall be garrisoned by troops sent from this country, or whether native troops shall be recruited for this purpose. Involved in this question are considerations of climate and subsistence; of vast expenses for transportation of men and food; of expenditures for wages and future pensions; of intricate hospital arrangements involving elaborate establishments, mutually dependent but thousands of miles apart. For the solution of a similar problem in China, the recent experiences of Great Britain at Wei Hai Wei are luminous in purpose and results, and most timely for immediate application to this country's needs, especially in the Philippines. It is worth while to study with the utmost care what England has done with her native battalion at Wei Hai Wei.

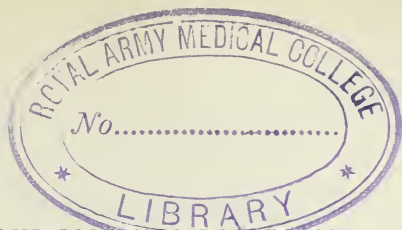
Forty miles to the eastward of Cheefoo, where in the year 1895, with the guns of the Russian fleet clearing for action, the treaty of Shimonoseki was ratified by China and Japan, lies the harbor of Wei Hai Wei. It is a bay formed by a sharp break in the rugged coast line, and is protected at its entrance by the island of Liu Kung Toa. Nature has been liberal to China in the matter of shelters to commerce, robbing the eastern shores of the Pacific that she might furnish the western with magnificent harbors and bays. Of these Wei Hai

¹ Read at the ninth annual meeting of the Association at the Academy of Medicine, New York, June, 1900, and also published in the *North American Review*.

Wei takes easily primary rank, with its capacious, deep, mud-bottomed harbor, and its natural defences.

Wei Hai Wei (pronounced as though it were written Way High Way) was founded in the reign of the Emperor Hung Wu, of the last (Ming) dynasty, about A. D. 1399. The third syllable—for there are three syllables rather than three words—means a walled military post; the first, though homophonous, means to awe, or, as we would say, to over-awe; the middle member of the name is the word for sea. Thus Wei Hai Wei is the "Terror of the Sea," so called because it was used as a base from which to subdue the pirates that infested the neighboring seas.

In the year 1883, the first steps were taken to fortify Wei Hai Wei, as a base for military operations; but the war with the French in 1894 led to the abandonment of the work before much had been accomplished. When peace came, the interrupted activity was renewed, and the rapidly growing northern ocean squadron of the Chinese navy found here its summer rendezvous, the harbor at Port Arthur, or Lu Shon Kon, as the Chinese call it, being far too small to shelter more than a few ships at one time. Later, two lighthouses were erected. Forts were built under German superintendence and supplied with guns by Krupp, whose agent, the late General Schnell, was instructor in gunnery in the Chinese garrison. Money was spent liberally, and excellent work was done in the way of fortifying the place, for the Mandarins got their "squeeze" not by "jerry building," but by purchasing less than was provided for, and by drawing money for the expense of battalions which never existed. And when they did go in for "jerry building," their methods were radical. The presiding genius of the day, Li Hung Chang, found on his last inspection, made just before the Japanese sank the "Kow Shing" and so opened the war, that a fort on the far east end of the bay had been built of wood. Mighty was the wrath of the great Li, and frightful the consternation of the two generals responsible for the fraud, fellow provincials and proteges of Li himself. They were instructed to rebuild at once, and with stone.



But whence the funds? These were found in a way that was simplicity itself. A battalion was estimated for, and although it never existed, save on paper, money was drawn for its maintenance. Stone was obtained speedily from the wonderful and inexhaustible granite quarries of Shih Tao, in the Shan Tung promontory and there it lies today, for the Japanese war put a stop to further fortifications. And when the Chinese Government recently turned the place over to the British, the local authorities had no knowledge of the existence of this material which was boldly claimed by a disgraced general.

On November 21, 1894, Port Arthur fell into the hands of the Japanese, who shortly began to turn their attention to Wei Hai Wei. On the 20th of January following, twenty-five thousand men were landed on the sheltered shore of Yung Cheng Bay under cover of the guns of the Japanese fleet. From that place to Wei Hai Wei, a march of more than forty miles was necessary over a country innocent of a road wider than a pack mule track, and on February 12, 1895, Wei Hai Wei was evacuated by the Chinese. Of their fleet, some were sunk and some captured. Admiral Ting, a brave officer, willing to fight, but under orders not to leave the harbor, chagrined and heart-broken, swallowed opium after signing articles of capitulation. The country around was occupied speedily and effectually by the Japanese. The treaty of Shimonoseki provided that Wei Hai Wei should remain in the hands of the Japanese until certain stipulations should be carried out, and for nearly four years Japan maintained a large garrison there, but on July 24, 1898, the Japanese flag disappeared from the harbor. For a brief time the Chinese emblem displayed its dragon swallowing the sun, shortly to find a companion in the Union Jack, and finally to disappear a few months later, leaving the British nominally, as they had been actually, in control of Wei Hai Wei, their new "sphere of influence."

It is on these historic shores that the experiment of transforming the Chinaman into a modern fighting machine has been successfully made by the newcomers, while the military

experts of the world are watching the results with increasing interest. And since the policy of our own country to retain permanent possession of our new insular colonies now seems established, we, too, should be especially interested in the experiment from a military as well as an economic point of view. Wherever the flag of England floats, there you will find her defenses maintained by native guardians. The flower of her army is not consumed in colonial garrisons. In India, the Gurkhas and Sikhs, officered by Englishmen, form her military reliance. In West Africa the Houssas are her defenders. In Egypt the Baggaras, transformed by the skill of Kitchener, rout the forces of the Mahdi. In the Windward and Leeward Islands and Jamaica, native regiments (blacks) are employed exclusively; so, too, in Australia and Canada, her soldiers are mostly native born, and in South Africa, until the outbreak of the present war, Zulus, supplemented by a small contingent of English troops, maintained her defense and security. Where, indeed, would England be to-day were it not for these native forces guarding her colonial empire, while her own soldiers are engaged in the Transvaal hostilities? Quick in her perception of this great advantage, she no sooner got possession of her new sphere in China than she at once set about organizing a means of defense by utilizing the material at hand, knowing that, if successful, she could at once eliminate two of the greatest problems besetting an army on a foreign shore, that of acclimatization, and of subsistence, with the attendant dangers of climatic and epidemic diseases.

It was my good fortune, on a recent visit to Wei Hai Wei, to meet Colonel C. H. Bower, R. A.—to whose genius has been intrusted the serious experiment of transforming native Chinese from mild-mannered Coolies to modern soldiers—to witness many of their drills, and to get from Colonel Bower's own lips his account of the work. He approached the task with many misgivings; but after six months of patient work his views changed radically. The First Battalion, Chinese Regiment, recruited during the past year, numbered at the time of my visit three hundred and sixty men, all from the Shan Tung Province, where the finest specimens of physical devel-

opment of China are to be found. These men are enlisted for three years, under the regular provisions of the British Army Act, for service in any part of the world. They have been selected with the greatest care. The average height is five feet eight inches, with a chest development of thirty-eight inches, a standard higher than that of the regular British army to-day. Three companies of one hundred and twenty men each were well advanced in training. The organization of the company in detail is similar to that in the United States Army. All the commissioned officers are British, but the non-commissioned staff, with the exception of one sergeant-major, one color-sergeant, one orderly-room clerk and one armor-sergeant, are Chinese.

It is certainly wonderful what a few months' hard work accomplished in "licking the 'rookies' into shape." Colonel Bower assured me that while originally he was far from being impressed with the idea of making soldiers of the Chinese—indeed he was decidedly prejudiced against even such an attempt—experience had convinced him of his error, and that he was now becoming an optimist. The initial processes of drilling were tedious and required much patience on the part of the drill-master; but the men soon learned to respect their superiors and became attached personally to them; and the officers, having once gained the confidence of the men, could do almost anything with them. Discipline was maintained with but little use of the guard-room, and drunkenness was unknown.

These Chinese recruits are remarkably respectful, orderly, docile and learn their tactics well; but the greatest patience has to be exercised with them until they fully understand their positions and are brought to a realization of their responsibilities, of which, in their early days, they seem to have no understanding. For more than six thousand years the Chinaman has followed his own method, and it is difficult to make him realize the importance of precision in military affairs. For instance, when a leave of absence for seventy-two hours is given to him, he will return perhaps in ninety-six, thinking it is all right. What's the difference? He cannot be made

to see it; "came back all right; three days all the same four, so long as he did come back." But when put in the guard-room for a week and made to do extra labor, his sleeping sense of duty is awakened and he does not repeat the offense. Notwithstanding that the drills at Wei Hai Wei have been very severe, desertions were unknown, although opportunity could be found easily, as the British concession or sphere of influence extends only ten miles inland. The uniform of the troops is rather picturesque: straw hats in the extreme heat of summer, to be replaced by turbans in winter; khaki blouses and breeches for the summer, to be exchanged for rough Irish frieze in winter; red cummerbunds, and putties instead of leggings, with the regular artillery boot of the British Army.

Colonel Bower was especially enthusiastic over the results of his men's musketry practice at the rifle butts. At the time of my visit they had been trained for short range work only, one, two, and three hundred yards; but their scores had been exceedingly gratifying, better even than those of the average British soldier after an equal amount of practice, to the great astonishment of all the officers of the regiment.

The cost of these troops to the British Government is another surprise. Their ration consists of one catty of rice (1.33 pounds), one-third catty of flour daily, and one pound of meat once a week. The cost of this to the British Government is \$2.15, Mexican, a month; the soldiers' pay is \$8.00, Mexican, a month, making the entire cost to the Government for the soldier and his subsistence \$10.15, Mexican, or \$5.00 gold, a month. All vegetables and luxuries are purchased by the soldier at his own expense. The health of the men was excellent. Since the organization of the regiment there had not been one death or a serious case of intestinal disease, although the period has included the most inclement season of the year. Colonel Bower was convinced that with a year or two more of training, his men would be equal to any soldiers in the world.

At the time of my visit, the battalion had its first experience in fighting fire. A conflagration occurred in the old city.



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On such occasions it is the custom of the natives to sit by supinely, watching the progress of the flames, even though a whole city may be in a blaze, or to indulge in looting. But the English officers were on the scene quickly with the Chinese battalion, a fire-brigade was organized promptly, water was passed up in buckets and the fire put under control, while the populace stood by and marvelled.

Within a year of their enlistment, these troops successfully stood the crucial test of leading a charge. In a sharp action with a vastly superior force of Boxers, the same who are now menacing the safety of the Chinese Empire in the Provinces of Shan Tung and Pi Chi Li, and about Tien-Tsin and the Imperial City, Peking, the Chinese Battalion, with their British officers, quickly routed the enemy, killing sixty and capturing a large quantity of arms. Their own casualties amounted to only two, both British officers, who were wounded. Thus they demonstrated beyond cavil their fidelity and loyalty to the new flag they had sworn to uphold, even when their opponents were their own countrymen.

Hitherto, we have been accustomed to laugh at the soldiery of China; but, indeed the fact that her soldiery is a laughing stock on account of lack of training and bad generalship, proves nothing against the Chinaman's courage. Fortunately there can be no question of his innate bravery. For a consideration, or when convinced that he is right, he puts the fear of death entirely out of his mind. Like the negro, the Egyptian or the Malay, all the Chinaman wants is the inspiration and leadership of resolute white officers. Conspicuous examples of their personal bravery are not lacking in the official reports of our own officers serving in the Philippines, notably those of Lieutenant Batson, of Major Bell, of Captain Sawtelle of General McArthur's staff, of Colonel Powell and Captain Durfee of the Seventeenth Infantry, and of Major Shields, Surgeon of the California Volunteers. My own observations on the firing line confirm these opinions. The Chinese drivers or litter bearers were as absolutely unconcerned under fire as though out in a snow-storm, and they obeyed their orders implicitly.

An incident illustrating the bravery of the coolie is narrated by Major Fitzgerald. It occurred at the battle of Malolos, in Luzon. An American soldier had fallen at the front; two coolies had rushed forward with their litter, consisting of a little hammock swung from a pole, and were bringing the man back to the dressing station, when a bullet pierced the thigh of one of the litter-bearers. He continued on, however, as though nothing had happened, until he deposited his charge beside the improvised operating table. Not until some time later was it found that the coolie was wounded severely and suffering intense pain. He endured it all with the patience and stoicism of his race, and expressed surprise that attention should be bestowed upon him at all; he had expected to be left by the wayside.

That the yellow and black races make excellent fighting material, when properly officered by whites, has been proved conclusively in innumerable instances. In our own army at San Juan Hill, the Twenty-fourth and Twenty-fifth United States Infantry and Tenth Cavalry, negro troops, led by their gallant white American officers, did as effective work as any men, regulars or volunteers, on the field. Nor did their heroism cease there. Later, when that more dreaded enemy, yellow fever appeared in every camp, and when volunteers were called for to nurse the sick and dying and to bury the dead, it was these men of the negro regiments who responded to the call, notwithstanding that their numbers had been terribly reduced in the battle only a few days before, and the fatal pestilence was raging in their own ranks. One hundred and twelve of these martyrs succumbed to the disease, but they quavered not in the hour of danger.

Nor is this record for fearlessness in the so-called inferior races confined to our own army. What did Kitchener do with the Egyptian peasants who for centuries had been regarded as menials and cowards? By tactics similar to those now being followed by Colonel Bower with the Chinese at Wei Hai Wei, he transformed them into cavalymen, who not only successfully resisted but charged and broke the bloodthirsty

followers of the Mahdi and defeated them with terrible slaughter. Fifteen years ago the idea of making a soldier of an Egyptian would have been ridiculed as a practical joke by military men. Training and the inspiration of leadership won the victories, and the Egyptian soldier of to-day has his place in history.

The experience of "Chinese" Gordon at the taking of the Taku forts in 1860 is eloquent in its showing of the individual bravery of the Chinaman. Large numbers of coolies were pressed into his service as cooks, litter-bearers and for transportation purposes. Arriving at the moats surrounding the forts, these slaves of duty seized the scaling ladders, rushed into the water nearly neck-deep, and in the face of a galling rifle and artillery fire placed the ladders on their shoulders from man to man, thus forming a continuous bridge supported by human pillars, and let the British army walk over their heads to the other side of the moat. Then, rushing from the water with their ladders, they ran to the walls of the fortresses, and were the first to scale their ramparts. Thus was courage inspired, and thus did it become contagious, even as panic and disaster would have resulted had the leadership failed.

Nor has Spain been without experience in the use of native troops in her colonies, in the very place where this urgent military question must be met and solved by the United States, namely in the Philippines, upon which Spain placed strong reliance, was her native Filipino troops, of whom, when Manila fell, she had about five thousand. They were among her best disciplined and bravest troops, familiar with the country, its warfare, its dangers and its ambuscades, in excellent health and thoroughly acclimated, speaking the language of the country, free from danger of tropical diseases, and subsisting on native foods. Our failure to secure them for service under the American flag was promptly taken advantage of by the wily Aguinaldo, who, upon condition of their swearing fealty to him and entering his army, promised them immunity from their countrymen and reward for their service. It was

in a temperate zone, when training for the ring, amounts to only twenty-eight hundred caloric units. It is an old saying that "it is the ration that wins the battle." As furnished to the soldier, the ration was an excellent winter food, rich in elements requisite for respiration under a low temperature; but for a tropical land, the enormous excess of carbon furnished by it to the lungs, over and above that which they could dispose of, imposed upon the liver and kidneys additional duties of elimination, producing congestions, fermentation and catarrhs, dyspepsia and lithæmia, glycosuria and phosphaturia, interfering with metabolism, and creating conditions favorable to bacteriological development, together with almost the entire train of diseases which have crowded our army hospitals. In phosphaturia, especially, the nervous system is deprived of the salts necessary for its proper function, which privation not infrequently results in mental disturbances that may end in suicide or insanity. How little the heat is directly responsible for these cases may be inferred from the extreme rarity of sunstroke in the tropics.

Dr. John Ordonaux, Emeritus Professor of Medical Jurisprudence in the College of Physicians and Surgeons, served with distinction thirty-five years ago in our War of the Rebellion as a volunteer surgeon. It was at that time that the famous saying, "Beans killed more than bullets," arose. In round numbers the mortality from bullets, directly and indirectly, was one hundred thousand, while that from disease was five hundred thousand, or five to one. Commenting on this fact thirty-seven years ago, "that the ration served our troops in the South was the same in winter as in summer," Dr. Ordonaux said:

"By proper disposition of his diet, man lives as healthfully under the Equator as under the Pole. The East Indian with his rice and yams, and the Esquimo with his seal blubber and putrid fish, are both healthy enough in their respective climates, but let them once change residences without changing their diet, and what would be the consequence? The Esquimo would be attacked with putrid fever, and the East Indian would die of inanition.

"We perceive from this the absolute necessity of modifying all forms of

diet in such a way as to accommodate them to the physiological requirements of varying seasons. For habit is not acquired as against laws of chemical combination, and no man can become habituated to doing that with impunity, which, being a violation of the physiological laws of his system, is, by its frequent admonitions of pain, notifying him of the evils about to overtake him.

"As the ration bill now stands, it presents us with too concentrated a form of diet for continued use. It abounds in fibrine, gluten, and fat, with out, however, a sufficiency in starch, mucilage, gelatin, and acids. Aromatic herbs and spices, without which health cannot for any length of time be preserved, particularly in hot climates or seasons, are entirely omitted, while fat pork, an article contra indicated in summer both by the state of the appetite and the physiological necessities of the system, stands as a sheet anchor of its animal food."

And of what avail was this prophetic warning? The ration table of the United States Army in the Spanish-American War was substantially the same as that during the Rebellion.

From the dawn of history experience has shown that, in time of war, disease was a far more deadly foe to an army than the bullets of an enemy. In the War of the Crimea the French lost in killed 21,000, and from disease 100,000, or about one from bullets and wounds to five from disease. The English losses in that dreadful campaign ran a little higher, the proportion between fatalities and bullets and wounds and that from disease being one to six.

In our Civil War, about the same proportions were maintained, one to five. In round numbers, 100,000 men fell on the field or died from wounds, and 500,000 perished in hospital wards from the more fatal enemy—disease.

But it has been reserved for the Spanish-American War to cause a blush of shame and indignation at the apathy and stupidity which has permitted preventable diseases to play such havoc with the army. In the campaign, the actual hostilities of which lasted from July 1st to August 12th, about six weeks, the mortality from bullets and wounds amounted to 268, while that from disease reached the appalling number of 3,862, or about fourteen to one. With proper subsistence and sanitation these proportions, for such a short service, should have been reversed.

With our military hospitals in the Philippines still crowded, despite the constant relief of their wards by shiploads returning on transports, and the decimating policy of irrationally subsisting the troops still in force, it behooves the United States to follow the example of England at the earliest possible moment and to resort to the only reasonable course left open for the maintenance of her army in the Orient, namely the utilization of native troops. Most authorities agree that it will require a garrison of at least forty thousand men to maintain order in the Philippines even after peace is declared, but I coincide with General Lawton, who told me that he thought it would require many more than that number to bring order out of chaos, to establish law in the various provinces and to maintain its complete supremacy.

The United States now has twenty-five regiments of volunteers in the Philippines, whose term of service will expire on June 30, 1901. Most of the enlisted men will wish to return at the expiration of that time, some sooner, while some will be willing to serve longer. A majority of the commissioned officers would welcome the opportunity to retain their places permanently. I would suggest that, at the earliest possible date, such of the enlisted men, not exceeding one-third, as desire their discharge on account of sickness or for other causes be allowed to leave the service. Then, from the third battalions of each regiment, let all the enlisted men, excepting a few non-commissioned officers in each company, be transferred to the other two battalions, thus filling them to their full strength. Enlist one battalion of Chinese, or of native friendly Filipinos (Macabees or Ilocanos), to each regiment making the composition of each regiment two battalions of white and one battalion of native troops, with white officers throughout, and a certain proportion of white non-commissioned officers in each native company. At such time as the authorities deem advisable, transform a second battalion of white to native troops in a similar manner. Then, when the proper time arrives, and the success of the move is demonstrated, transform the third battalion of each regiment, and, as circumstances

may justify, replace such of the white non-commissioned officers as may seem best for the interests of the service by native non-commissioned officers, but keep white commissioned officers first, last and all the time.

Published statistics recently furnished by Congress state that the cost of the army in the Philippines in the last year was about \$150,000;000. It is easily within reason to declare that each fighting man costs the Government more than one thousand dollars, gold, a year, for pay, subsistence, cost of transportation service and medical attendance, without any calculation for his future pension claim. The pay of the American soldier in the Philippines is sixteen dollars, gold, a month. His ration costs far more, when the enormous wastage and cost of transportation is calculated. It is no uncommon incident for entire cargoes of beef to be lost in transportation across the Pacific. I know of three such instances last summer. And in calculating the cost of the American soldier no mention has been made of the expenses of hospitals with their medical staffs, nurses, orderlies, helpers, etc., all of which add enormously to the expenditure.

The native Chinaman or Filipino can be enlisted in unlimited numbers for ten dollars a month, and can be subsisted for four dollars more. Additional expenditures for transportation, etc., might cost two dollars more, making a total of sixteen dollars a month, or not more than two hundred dollars, gold, a year, or about one-fifth of our present expenditure, and with no danger from an everlasting pension claim in the future.

In an interview with Li Hung Chang, at his palace in Peking, some months prior to the outbreak of hostilities in China, he assured me that China would interpose no objection to the enlistment of her subjects in the American army. But if, in the present crisis, such recruits are not considered desirable, there are many friendly Filipinos to be substituted. Great Britain recruits her ranks from various tribes or castes in India, and tribal hatreds are often utilized in the pacification of outbreaks among the natives. The same policy can be advantageously followed by us in the Philippines, where the

friendly tribes of Ilocanos and Macabees are the implacable foes of the rebellious Tagals.

England has a great advantage over the United States in colonial government and in colonial military affairs, in that there is not always a home party in opposition wanting to apply the Constitution to the natives, telling the discontents that as soon as their party gets control all complaints and wrongs will be rectified. The home Government acts as a unit and with a consistency that challenges the admiration of the world.

It remains to be seen whether by the liberal utilization of native troops, we shall save the flower of our army for service at home, and preserve it from degrading conditions that, alas! too often are brought to this country by returning troops. And it also remains to be seen whether the country shall be spared the depletion of its Treasury through extravagant expenditures caused by improvident military administration leading to enormous pension claims. The Spanish war has resulted in the filing of over twenty-five thousand of these claims already. Who can say what the number will be when those resulting from the Philippines campaign are recorded?



SOME SUGGESTIONS WITH RESPECT TO THE
CHARACTER AND METHOD OF CARRIAGE
OF MEDICINES INTENDED FOR USE
IN FIELD HOSPITALS.

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WHILE in charge of the exhibit of the Medical Department at the Pan-American Exposition, the writer was impressed, as a result of a careful study of the new field hospital equipment, as authorized in the Manual for the Medical Department, 1901, with certain defects in the existing methods of supplying and transporting medicines for field use, which, though serious, nevertheless, appeared capable of being readily corrected by simple measures.

The pills and tablets supplied to the Medical Department by manufacturing pharmacists, even when containing equal quantities of the same drugs, vary greatly from each other in size, form and appearance. Each manufacturer apparently desires to preserve the individuality of his product by giving it special characteristics. However advantageous this practice may be to them from a commercial standpoint, it is highly undesirable so far as the Medical Department of the army is concerned, and especially so for conditions of field service. In the field medicine chests, each container is supposed to hold a definite and fixed number of doses of medicine; and uniformity in this respect is as essential as uniformity in the allowance and supply of ammunition for large and small ordnance, to which this condition is obviously comparable. Under present conditions, a can intended to hold 1000 tablets, each of which

is a single ordinary dose, may, if replenished from a supply of medicine purchased under contract from another pharmaceutical firm, contain as many as 1300 tablets or doses, or as few as 700 tablets or doses—thus causing a variation of as much as 60 per cent. in the amount of medicine available for use in the treatment of the sick. Obviously, a supply of medicines officially intended to meet the needs of a body of troops for the period of three months may thus suffice for only about two-thirds that time, or, on the other hand, may be sufficient for an equal number of men for four months. Hence, under present conditions, the medical officer never can have even an approximate idea of the number of doses of any given kind of medicine contained in his field chests.

To remedy this condition, it was lately recommended by the writer that the authorities of the Medical Department confer with several of the more prominent manufacturing pharmaceutical firms, for the purpose of definitely establishing an "army standard" to govern the form and sizes of tablets and pills to be purchased for future use in that department. These standard sizes should be stipulated in the making of future contracts for medicines, and any supplies furnished, not in accordance with these specifications, should be rejected. It is believed that three sizes of tablet will be sufficient in variety for this purpose. The small size should include those drugs in which the ordinary dose occupies a small space, such as morphine, strychnine, digitalis, podophyllin, etc. The medium size tablet should be employed for those drugs in which the ordinary dose varies from 200 to 300 milligrams, such as salol, phenacetin, quinine, Dover's powder, chloral, etc. The large size tablet should include the few drugs at present provided in large tablets, as seen in the linimentum rubefaciens tablet, the antiseptic tablet, the sodium carbonate tablet, etc. If necessary, the large tablet last mentioned might safely be omitted and these drugs put up in the 300 milligram size tablet. The various size tablets should be multiples of each other, so that—for instance—four small tablets should occupy in bulk as nearly as possible the same space as a single tablet of the next larger size.

The same principles should also apply to all hypodermic tablets, the size of which should depend upon the diameter of the tablet tubes carried in the standard hypodermic cases supplied. At present, some of the hypodermic tablets supplied by certain dealers are too large to go in the small tubes contained in the hypodermic cases issued by the Department, and hence bottled supplies of such tablets are not available for the replenishment of empty tubes. Further, the small glass tubes of hypodermic tablets furnished by different manufacturers have no standard caliber, and frequently these tubes are so large that they cannot be carried in the standard hypodermic cases, when the tubes originally furnished with the latter are empty, lost or broken. It would thus seem as if the question of instituting standard sizes for medicine tablets, both those for ordinary use and for hypodermatic medication, is worthy of careful consideration.

The present methods of packing medicines in bulk for field use, as in the reserve supply of medicines authorized for the brigade field hospital, together with the character of the containers in which such medicines have heretofore been supplied by the manufacturers, are open to serious objections—by reason of the excessive time and labor required in packing and unpacking, the great liability of breakage, the necessity of always having at hand some packing material, as grass, leaves, hay or excelsior, the difficulty of securing any given article from a packed box or chest, and, finally, of the greatest importance under field conditions, the excessive amount of transportation required for its carriage as compared with the quantity of medicine actually transported.

The allowance of drugs, medicines, and antiseptics for the model brigade field hospital, which was exhibited by the Medical Department at the Pan-American Exposition, were received from the supply depot contained in fifteen (15) old style food chests, besides which there were several smaller boxes containing alcohol and stimulants. The bottles were packed in sawdust, paper, excelsior and other material to prevent breakage; examination of the bottles showing them to

have been supplied in nearly one-hundred different varieties, shapes and sizes. The chests, uncrated, had an average weight of about 170 lbs. each—or 2,550 lbs. for the fifteen chests and a total weight for the chests and boxes of about 3,000 lbs. As a result of careful examination and estimation of the cubic space actually occupied by the drugs, medicines and antiseptics contained in these chests and boxes, the writer was convinced that an improved method of packing would permit the carriage of these articles in six (6) chests, probably weighing altogether not to exceed 1,100 lbs.; thus rendering unnecessary the transportation of nine (9) chests and several smaller boxes, and reducing the weight to be carried with the brigade hospital by about one (1) ton—or what would be four-fifths of a wagon-load for four mules under the most ordinary conditions.

To accomplish this result, the writer recommended that all bottles, packages and containers in which medicines and drugs, either solid or liquid, are supplied by pharmacists in filling army contracts, should, in the future, be required to conform to fixed standards in respect to size and shape; these standard shapes and sizes to be specified in all contracts made by purchasing officers, and medicines not contained in such bottles to be rejected by medical purveyors except under stress of great emergency. These standard bottles should be square in horizontal section with slightly rounded corners, and should have short necks with wide mouths. The bottles should be of but two sizes in horizontal section, the larger size being 4 inches square at the base and the smaller size being 2 inches square at the base. Both these sizes of bottle should have a total height of 6 inches; the height to the shoulder being 5 inches and the neck of the bottle having a height of 1 inch. The larger size bottle of these dimensions holds one liter, while the smaller size bottle holds 250 cubic centimeters. The corks of these bottles should be seated flush with the top of the neck, for the greater economy of space in packing. If desired, a third size bottle may be employed: this being 2 inches square in horizontal section 2½ inches high to the shoulder, and 3 inches high over all. One large bottle thus occupies the cubic space required

by 4 small bottles ; or if it be thought desirable to use a certain number of smaller size containers, the large bottle would occupy the cubic space required by 8 of these smallest bottles.

The large bottles, as supplied by the contracting pharmacists, should be packed as follows: A layer of paraffine paper over the glass and label ; then a protective box or covering of corrugated card-board having a thickness of one-fourth inch and forming a rectangular package ; then an outer labeled covering of stout glazed paper. The smaller bottles are packed with a layer of paraffine paper next the glass and then a protective covering of corrugated card-board one-eighth of an inch thick over all. Four of these smaller bottles—or 8 of the smallest size bottles, if the latter are used—are wrapped together in stout glazed paper ; thus forming a package of the same size as that containing a single large bottle. A “package unit” of definite size and shape is thus created, and all such packages, whether containing large or small bottles, are interchangeable.

For the carriage in the field of drugs contained in such “package units”, stout chests should be provided, similar in character and construction to the old pattern hospital food and mess chests. These chests should preferably be of such a size as to be readily handled, and capable, in emergency, of transportation on mule-back. Their weight should be such that two such chests will form a full back-load for a mule, one chest being slung on each side of the pack-saddle. Such chests should have an inside width of 4 “package units,” or 18 inches. The inside length should be equal to 6 “package units”, which, together with the thickness of a single stout transverse partition, gives a total inside length of 28 inches. Each layer in the chest thus contains 24 “package units”, divided transversely by a partition which prevents movement of these packages when a chest is partially emptied of its contents. Each chest should contain three such layers of “package units”, the two upper layers being each contained in a stout tray, divided transversely by a partition. As each layer of “package units” is $6\frac{1}{2}$ inches high, the inside height of the chest, in-

cluding the thickness of the two tray-bottoms, would be $21\frac{1}{2}$ inches. Each chest would thus contain 72 "package units"; containing a maximum of 72 bottles, of one liter capacity each, 288 bottles of 250 cubic centimeters capacity each, 576 bottles of about 115 cubic centimeters capacity each—or such combination of these different sized bottles as might be desirable. The six chests proposed would thus contain 432 bottles of one liter capacity each, or 1728 bottles of 250 cubic centimeters capacity each, which it is believed would contain the entire reserve supply of medicines in bulk as now authorized for the brigade field hospital. Such chests would probably weigh in the neighborhood of from 125 to 135 pounds each. If desired, the chests could be made somewhat larger, say having a length of 7 "package units", a width of 5 such units and a height of 3 units. Such chests, however, would require wheel transportation and would not be as suitable for field conditions, under all circumstances, as the somewhat smaller chests recommended.

In packing the medicines, drugs or supplies to be contained in these chests, the "package units" should be arranged alphabetically according to their contents, beginning with the letter "A" in the top tray of chest No. 1—so that the position of any article desired may be at once located and the latter is made readily accessible by merely opening a chest and perhaps lifting out a tray. Under present conditions, even if it is known in which box a desired article is contained, it is frequently necessary to remove, nearly or quite all the bottles and excelsior or other packing material from the box before the special bottle or medicines desired can be secured—this being accompanied with a great and unnecessary expenditure of time and labor and great liability to breakage. Ordinary boxes also soon go to pieces under the rough handling necessary in packing and unpacking.

With a method of packing as above proposed, it is obvious that the number of partitions required are reduced to a minimum, space is economized and at the same time the contents of the chest are perfectly protected against injury and breakage.

Any vacant spaces caused by the removal of bottles from various compartments may be filled by corresponding "package units" taken from another compartment—as from one of those in an upper tray—so that movement of contents, with resulting breakage, is readily rendered impossible during transportation, even if the chest has been emptied of as much as five-sixths of its maximum contents. If new medicines and supplies are sent out to replenish the brigade hospital reserve chests, these—if contained in the standard bottles and packages already proposed—may be dropped into their proper places in the chests without difficulty or delay, the necessity of breaking up any original packages or the use of packing material. Medical supplies issued for use in posts, if contained in these standard size packages, could thus be taken directly from the shelves of the dispensary or store room and packed in a few minutes in these standard size chests for transportation with a command about to take the field. Any desired assortment or quantity of drugs, in excess of the official allowance contained in the regimental medical chest, could thus be carried into the field with the minimum of space, weight and liability to breakage. It is obvious that liquids can be carried as readily as solids by this method of packing. Another advantage is that bottles which have been emptied of their contents may then be used for dispensing medicines in solution, and until they are required for this purpose they are merely replaced in their original cardboard packages and carried along in the chest until needed. Medical accessories, such as spare corks, plasters, tablet envelopes, etc., should also be put up in packages of the same size and shape as has been proposed for bottled articles so that their transportation and packing would be facilitated. All articles of a medical character would thus be supplied in packages of a standard shape and size.

It would seem that some method is much to be desired by which medicines and other articles which must be supplied in bulk may be carried in the field with greater safety and with less weight and bulk than is possible under present conditions of issue and carriage. It is believed that this object is best accomplished by the simple method above proposed, which, as has been shown, reduces the amount of material to be transported with each brigade hospital unit by nearly a wagon-load.

REGULATIONS FOR THE GUIDANCE OF SURGEONS
AND POST SURGEONS IN THE MEDICAL
EXAMINATION OF RECRUITS FOR
THE NATIONAL GUARD.

By BRIGADIER GENERAL J. FRANCIS CALEF,

MIDDLETOWN, CONN.

SURGEON GENERAL OF CONNECTICUT.

DURING the last two years, I have had at least a hundred calls for these regulations, prepared for the examination of recruits in the Connecticut National Guard, with which I was unable to comply, as they were published by the State. In the belief then that they may be useful to the medical officers of other states, they are submitted to the Association of Military Surgeons.

GENERAL INSTRUCTIONS TO EXAMINING SURGEONS.

The age of recruits must be between 18 and 45 years; musicians, between 16 and 50 years.

The height of recruits, in stocking feet, must not be less than 64 inches*; musicians, 63 inches. The relation of weight and chest measurements to heights should not be less than in the table given below. In well-built men the width of the shoulders, when arms hang at the sides, will be about two-ninths of the height.

The leading characteristics of a good constitution are thus enumerated by Tripler: "A tolerably just proportion between the different parts of the trunk and members; a well-shaped head, thick hair, a countenance expressive of health, with a lively eye, skin not too white, lips red, teeth white and in good condition, voice strong, skin firm, chest well formed, belly lank, parts of generation well developed, limbs muscular, feet arched and of a moderate length, hands large. The gait

*If under 21 years of age, a reduction of 1 inch will be allowed.

should be sprightly and springy, speech prompt and clear, and manner cheerful. All lank, slight, puny men, with contracted figures, whose development is, as it were, arrested, should be set aside. The reverse of the characteristics of a good constitution will indicate infirm health or a weakly habit of body; loose, flabby, white skin; long, cylindrical neck; long, flat feet; very fair complexion, fine hair; wan, sallow countenance," etc.

Recruits must understand the English language sufficiently to receive orders, and have intelligence enough to execute them. They must have sound constitutions, and must in all respects be up to the standard herein set forth for service in the Connecticut National Guard. Surgeons will bear in mind that every disqualification for service in the United States Army must be carefully recorded, even when it does not disqualify for service in the National Guard.

Recruits must be examined by some authorized surgeon; and a full report of such examination (on blanks furnished for that purpose) must be filled out in ink and promptly transmitted to the office of the Adjutant-General through regular *medical* channels.

For each examination so made and reported the surgeon shall receive from the State a fee of one dollar.

The surgeon will make the examinations as privately as possible, in a large well-lighted room, with the recruit stripped.

To insure uniformity of results the following method of examination is recommended: The surgeon should ask the questions in the first part of the blank and clearly record the answers exactly as made, noting any indications therein for a special examination of the recruit. The recruit should sign the statement when completed. He should then, before stripping the man, note on the examination blank his name, weight, height, general appearance, and color of hair and eyes. Then note the rate and character of the pulse and respirations while sitting at ease. The mental and moral characteristics are next noted. A careful examination of the head, ears, eyes,

face, mouth, and fauces should be made, and any disqualification for service in the Army of the United States recorded on the examination blank.

In the United States Army, deafness of either ear constitutes an absolute cause of rejection. The examination should be made as follows, and the result noted on the examination blank:

"As the distance at which the natural tone of voice may be heard in a closed room, when both ears are normal, is about fifty feet, the distance at which the applicant is to stand from the examiner must be as great as the apartments will allow, not to exceed fifty feet."

"The recruit will stand with his back to the examiner, who is to address him in a natural tone of voice. When the distance is less than forty feet, it should be specified on the examination form, and the tone of voice will be lowered. Failure of the applicant to respond to the address of the examiner will demonstrate a defect."

Special attention must be given to closing the entrance to each ear separately, by pressing with the thumb the small lobe (tragus) situated in front of the opening to the inner ear.

Advantage should be taken of the absence of other sounds to make the examination. Surgeons should remember that a man may be totally deaf in one ear, and yet may hear all ordinary conversation perfectly if the sound ear is not completely stopped. "Deafness may be caused by an accumulation of hardened wax; therefore an otherwise desirable recruit should have his ears well cleansed before final action is taken in his case."

All men assigned to the artillery arm of the service shall, before such assignment, besides undergoing the ordinary examination, be examined especially with a view to establishing the fact of the patency of the Eustachian tubes and the integrity of the tympanic membranes, in default of which the men are unfit for that arm.

Inability to read or describe with facility the types or characters on the test cards.—This examination requires the great-

20 Feet.

M W E M E E

E M E E M E

20 Feet.

L B N T E P G

F N E O L E A

G C R F U J S

THE VISION TEST CARDS.

est care and patience on the part of the surgeon; it is made with cards bearing the twenty-foot test types and test characters.

To use the cards, measure off a distance of twenty feet in a straight line; place the applicant with his back to the light at one end of the line, while the examiner stands at the other and holds the card exhibiting the test types or characters in full view of the applicant and so that a good light falls on the card. Each eye should be examined separately, one being covered with a card (not with the hand) by the applicant. The surgeon then directs him to read the types on the card; if he cannot read, the card bearing the characters is presented to him, which he is directed to describe. The types should be read first from left to right, and then from right to left; the characters should be described as to the number of arms seen on each and the direction in which they are pointed, whether upward or downward, to the right or left.

If the applicant should be unable to read the test types or describe the test characters correctly with either eye at twenty feet, he must be directed to step nearer, and the distance at which he reads the types should be measured and noted on the examination blank.

“A large percentage of men are the subjects of slight visual defects, not to such an extent as to disqualify them for military duty, but sufficient to cause a little blurring or indistinctness in some of the letters of the required test, which may be increased by the nervous apprehension of failure. Ignorance, stupidity or fear on the part of an applicant are factors to be considered in making this examination, and unless the surgeon exercises sound judgment he will probably reject men whose vision is in reality good; hence plenty of time should be taken and slight errors, such as misreading a P or T for an F, provided the majority of the letters or test characters are read with facility, need not be regarded as a failure of the test.”

PHYSICAL EXAMINATION OF A RECRUIT. RECRUIT'S STATEMENT.

Name, _____; single, married*; age, _____ yrs.; birthday, _____; residence, _____; race,† _____; occupation, _____; if rejected, for have you before applied for enlistment? If so, where? _____; what cause? _____; what sickness have you had, and at what age? _____; nationality of father, _____; if either parent has died, state cause, _____; if brother or sister has died, state cause, _____; have you found your health or habits to interfere with your success in civil life? _____; are you subject to dizziness? _____; to severe headache? _____; to pain in the breast? _____; to fluttering of the heart? _____; to shortness of breath? _____; to cold in the head? _____; to coughs? _____; to diarrhoea? _____; to piles? _____; to rheumatism? _____; do you believe you are sound and well now? _____; have you had sore eyes or any defect of vision? _____; discharge from either ear? _____; fits? _____; if so, how frequently? _____; a discharge of matter from, or a sore of any kind upon your penis, and when? _____; any swelling about or of your testicles? _____; a boil near the anus (fistula)? _____; is your sense of hearing good? _____; have you been ruptured? _____; do you drink intoxicating liquors? If so, to what extent? _____; have you been hurt upon the head? Answer fully, _____; have you had a sprain? _____; a stiff joint? _____; a bone or joint out of place? _____; or a bone broken? _____; are you subject to painful corns or sore feet? _____; mention carefully injuries or surgical operations you may have had upon any part of your body, especially burns, cuts, severe bruises, etc., _____; have you had yellow fever? _____; small pox? _____; when were you last successfully vaccinated? _____; have you ever been convicted of a felony, or been imprisoned in a jail or penitentiary? _____.

† Certify, That I have with care asked the foregoing questions and have recorded the answers as made to me.

Recruit.

Surgeon.
* Cross which he is *not*—widower single. † White or Black.

SURGEON'S REPORT.

Height, _____ in.; weight, _____ lbs.; color of hair, _____; of eyes, _____; figure and general appearance, _____; sitting at ease, pulse, No. _____; character, _____; respirations, No. _____; character, _____.

1. All mental infirmities absent, except _____.
2. All moral infirmities absent, except _____.
3. All head disqualifications absent, except _____.
4. All ear disqualifications absent, except _____.

5. All eye disqualifications absent, except .

without* glasses—right eye, ft.; left eye, ft.⁴
Reads test type and describes test figures with

6. All face disqualifications absent, except .

7. All mouth and fauces disqualifications absent, except

8. Cerebo-spinal system sound, except

9. All general disqualifications absent, except

10. All skin disqualifications absent, except

11 All neck disqualifications absent, except

12. All spinal disqualifications absent, except

13. All chest disqualifications absent, except

Measurement of chest at angle of scapula, fully expanded, in.; fully contracted, in.

Apex beat of heart	{	left intercostal space	{	Body erect. Linear distances. from interclavicular notch to crest of pubic bones.
		in. side nipple line†		
		Valvular sounds		

14. All abdominal disqualifications absent, except

Measurement of abdomen at navel, in.

15. All genito-urinary disqualifications absent, except

16. All disqualifications common to upper and lower extremities absent, except

17. Superior extremities sound, except

18. Lower extremities sound, except

REMARKS:

*If glasses are worn, strike out *without*; if not worn, strike out *with*.

†Indicate how much *inside* or *outside* vertical line drawn through left nipple, recruit standing and breathing quietly.

If Certify That I have carefully examined the above-named recruit. He has no mental or physical defect disqualifying him for service in the Connecticut National Guard, and only those above set forth, for service in the Army of the United States. He speaks, reads, and writes the English language, his intelligence is, and he has presented satisfactory evidence of good character.

Place.

, Conn.

Surgeon C.N.G.
Post Surgeon.

Date, .

NOTE 1. This examination should be made by an Active Surgeon, C.N.G.; if none resides in the town, by a Surgeon-(retired) C.N. G., or Post-Surgeon. As soon as completed, this form will be forwarded to, the Surgeon-General.

NOTE 2. This blank form will be held in the custody of the Surgeon, who will see to it that the questions are not made known to the recruit in advance of his examination.

NOTE 3. In case the word EXCEPT is not plainly canceled, it will be inferred that the question has been overlooked. Please review carefully before this leaves your hands. (All blank spaces on this form, except that reserved for the Surgeon-General, must be filled by the Examining Surgeon.

EXAMINATION OF RECRUIT.

Name, _____
Enlisted at _____
this _____ day of _____
Co _____

Regt., C. N. G.

BY

Comdg. Co., _____
Regt., C.N.G.
Enlisting Officer.

This recruit has been examined by me this _____ day of _____ and _____ is _____ recommended for service in the _____

Connecticut National Guard.

Reviewed by me this _____ day of _____

Surgeon C. N. G.
Post-Surgeon.

approved.

and

Surgeon-General.



The recruit should now be stripped, providing no disqualification for service in the Connecticut National Guard has been discovered. If such disqualification is found, the examination may stop here; but a full description of the condition must be given under the head of remarks, and the paper promptly forwarded to the office of the Adjutant General. Being stripped, the recruit should be put through the motions of walking, running, and leaping, and directed to take such positions as will demonstrate the action of all the joints; the pulse and respirations should be again noted while sitting.

Examine the skin, spine, cerebro-spinal nervous system, neck (especially for enlarged glands); *chest*—its shape (flat or pigeon-breasted), resonance, character of respirations; *heart*—sounds, impulse (position and force) action (as to regularity); abdomen (especially for hernia and enlarged glands in the groin); genito-urinary apparatus; anus (especially for fistula); upper extremities (especially for enlarged glands at the elbows): lower extremities.

TABLE OF PHYSICAL PROPORTIONS.

HEIGHT.	MINIMUM WEIGHT.	MINIMUM CHEST MEASUREMENT.	
		Inspiration	Mobility.
	<i>Pounds.</i>	<i>Inches.</i>	<i>Inches.</i>
63 inches - - -	110	32	2
64 inches - - -	111	32	2
65 inches - - -	114	32½	2
66 inches - - -	116	32½	2
67 inches - - -	118	33	2
68 inches - - -	124	33¼	2½
69 inches - - -	130	33½	2½
70 inches - - -	135	34	2½
71 inches - - -	139	34¼	2½
72 inches - - -	142	34¾	3
73 inches - - -	147	35¼	3

An easy way to compute the *average* weight for any height is to calculate two pounds for each inch of height up to sixty-

seven inches, and add seven pounds for every inch above that height.

When measurements and weight approach the minima above given, extreme care should be exercised in the physical examination of the chest, and such other examination made as will exclude the presence of diabetes or other serious constitutional conditions. If the recruit is over 21 years of age his weight must be ten pounds more and the measurement of his expanded chest two inches greater than in the above table.

CONDITIONS EXEMPTING FROM ALL MILITARY DUTY.

Permanent—Idiocy, imbecility, dementia, all chronic forms of insanity; dislocations, or fractures so badly reduced as to disqualify for manual labor; deafness of both ears; loss of an eye; total paralysis of a limb, loss of either limb; organic disease of the heart; advanced phthisis pulmonalis; such herniae as cannot be held in place by a truss; any disease or injury as permanently disqualifies for remunerative labor.

DISQUALIFICATIONS FOR SERVICE IN THE UNITED STATES ARMY AND IN THE CONNECTICUT NATIONAL GUARD IN TIME OF PEACE.

I. MENTAL INFIRMITIES.

UNITED STATES ARMY.

CONNECTICUT NATIONAL GUARD.

Insanity, idiocy, imbecility, dementia. Same for Connecticut National Guard

II. MORAL INFIRMITIES.

Intemperance in the use of stimulants or narcotics, conviction of felony, mas- turbation, sodomy. Same for Connecticut National Guard.

III. THE HEAD.

Abnormally large head; considerable deformities, the consequence of fracture; serious lesions of the skull, the consequence of complicated wounds or the operation of trephining; caries and exfoliation of the bone, injuries of cranial nerves, tinea capitis, alopecia. Same for Connecticut National Guard.

IV. THE EARS.

Deafness of one or both ears; all catarrhal and purulent forms of acute and chronic otitis media, polypi and single ear will not disqualify. The re-

UNITED STATES ARMY.

other growths or diseases of the tympanum, labyrinth, or mastoid cells; perforation of the tympanum; closure of the auditory canal, partial or complete, except from acute abscess or furuncle; malformation or loss of the external ear and all diseases thereof, except those which are slight and non-progressive.

CONNECTICUT NATIONAL GUARD.

recruit should be able to repeat words spoken in an ordinary tone at a distance of forty feet.

V. THE EYES.

Loss of an eye, total loss of sight of either eye; conjunctival affections, including trachoma, entropion; opacities of the cornea, if covering part of the moderately dilated pupil; pterygium, if extensive; strabismus, hydropthalmia, exophthalmia, conical cornea, cataract, loss of crystalline lens, diseases of the lachrymal apparatus, ectropion, ptosis, incessant spasmodic motion of the lids, adhesion of the lids, large encysted tumors, abscess of the orbit, muscular asthenopia, nystagmus.

Any affection of the globe of the eye or its contents; defective vision, including anomalies of accommodation and refraction; myopia; hypermetropia, if accompanied by asthenopia; presbyopia, astigmatism, amblyopia, glaucoma, diplopia, color blindness (for signal service only).

VI. THE FACE.

Naevi, unsightly hairy spots, extensive cicatrices on the face.

Same for Connecticut National Guard, if quite marked.

VII. THE MOUTH AND FAUCES.

Hare-lip, simple, double, or complicated; loss of the whole or a considerable part of either lip; unsightly mutilation of the lips from wounds, burns, or disease; loss of the whole or part of either maxilla, ununited fracture, ankylosis, deformities of either jaw interfering with mastication or speech, loss of certain teeth, cancerous or eruptive tumors, hypertrophy or atrophy of the tongue, mutilation of the tongue, hesion of the tongue to any parts, venting its free motion; malignant disease of the tongue, chronic ulcerations, fissures or perforations of the hard palate, salivary or bucco-nasal fistulae, hypertrophy of the tonsils sufficient to interfere with respiration or phonation.

Same for Connecticut National Guard, except single hare-lip, when not conspicuous, will not disqualify. Unless a recruit has four sound double teeth, one above and one below on either side of the mouth, so opposed as to serve the purpose of mastication, he should be rejected. Absence of the front teeth will not reject. If the quota of natural double teeth are absent a good set of artificial teeth will be accepted, but their presence must be noted on the examination form.

VIII. THE CEREBRO-SPINAL SYSTEM.

UNITED STATES ARMY.

Epilepsy, chorea, all forms of paralysis, tabes dorsalis, neuralgia, stuttering.

CONNECTICUT NATIONAL GUARD.

Same for Connecticut National Guard, except neuralgia must be persistent to disqualify.

IX. GENERAL DISQUALIFICATIONS.

Feebleness of constitution (poor physique), scrofulous diathesis, cancerous diathesis, syphilis.

Same for Connecticut National Guard. Before pronouncing an applicant syphilitic, at least two of the following characteristic signs of the disease should be discovered and noted on the blank: painless, multiple, enlargement of the lymphatic glands at the back of the neck, on the inside of the arm above the elbow, or in the groin; a copper-colored eruption on skin, without pain, itching, or surrounding hyperaemia (especially if on the forehead or chest); scaly eruption on the palms of the hands, hair very thin or absent in patches (alopecia); characteristic mucous patches or ulcers in the mouth or nose; nodes on the shin-bones, and warts about the anus. The frequent respective symmetry of syphilitic lesions should be remembered.

X. THE SKIN.

All chronic, contagious, and parasitic diseases of the skin; naevi; extensive, deep, and adherent cicatrices, chronic ulcers, vermin.

Same for Connecticut National Guard, except a chronic disease, slight and not contagious, and small naevi, will not disqualify.

XI. THE NECK.

Goitre, ulcerations of the cervical glands, cicatrices of scrofulous ulcerations, tracheal openings, wry neck, chronic laryngitis, or any other disease of the larynx which would produce aphonia, stricture of the oesophagus.

Same for Connecticut National Guard, except goitre disqualifies only when so large as to interfere with breathing or the hooking of the coat of the collar, or if recent or growing.

XII. THE SPINE.

Caries, spina bifida, lateral curvature of the cervical, dorsal, or lumbar regions; lumbar abscess, rickets, fracture and dislocation of the vertebrae, angular curvatures, including gibbosity of the anterior and posterior parts of the thorax.

Same for Connecticut National Guard, except gibbosity of the thorax, which does not interfere with the free action of the heart or lungs, need not disqualify. "To detect curvature of the spine, draw an imaginary line from the center of the base of the skull to the end of the spine. If it passes one inch either side of the spinal prominence, reject."—(Parker.) Something more than one inch may sometimes be allowed recruits for Connecticut National Guard if otherwise sound.

XIII. THE CHEST.

UNITED STATES ARMY.

Malformation of the chest, or badly united fractures of ribs or sternum sufficient to interfere with respiration; caries or necrosis of ribs, deficient expansive mobility, evident predisposition to phthisis pulmonalis, chronic pneumonia, emphysema, chronic pleurisy, pleural effusions, chronic bronchitis, asthma, organic disease of the heart or large arteries, serious and protracted functional derangement of the heart, dropsy dependent upon a disease of the heart.

CONNECTICUT NATIONAL GUARD.

Same for Connecticut National Guard.

XIV. THE ABDOMEN.

All chronic inflammations of the gastro-intestinal tract, including diarrhoea and dysentery; diseases of the liver or spleen, including those caused by malarial poisoning; ascites, obesity, dyspepsia, if confirmed; haemorrhoids, prolapsus ani, fistula in ano, considerable fissures of the anus, hernia in all situations.

Same for Connecticut National Guard, except quiescent external haemorrhoids need not disqualify.

"External piles appear as tumors or loose flabby folds of skin about the verge of the anus, and may be *recent* or *old*. If *recent*, they will appear about the size of a buck-shot, of a bluish color, hard and tense to the feel, and their covering will look thin. If *old*, they will probably be as large as a marble, of a brawney feel, reddish-brown color, and have a thick covering. If *recent*, as above described, they are *not* cause for rejection, *neither are they if old and single* and the applicant asserts that they have never been painful or troublesome; but if there should be *more than one old pile* and they are larger than described, or if a *single old pile* is ulcerated or inflamed, or if there is a small pile *associated with varicose veins of the legs*, the applicant should be rejected. The flabby folds of skin are not cause for rejection unless very large."

XV. THE GENITO-URINARY ORGANS.

Any acute affection of the genital organs, including gonorrhoea and venereal sores; loss of the penis, phimosis, stricture of the urethra, loss of both testicles, permanent retraction of one or both testicles within the external ring, any chronic disease of the testicle, hydrocele of the tunic and cord, atrophy of the testicle, varicocele, malformations of the genitalia, incontinence of urine, urinary fistulae, enlargement of the prostate, stone in the bladder, chronic cystitis, all diseases of the kidney.

Same for Connecticut National Guard, except phimosis, retention of one or both testicles within the abdominal ring, and a moderate hydrocele or varicocele need not disqualify.

XVI. AFFECTIONS COMMON TO BOTH UPPER AND LOWER EXTREMITIES.

UNITED STATES ARMY.

Chronic rheumatism, chronic diseases of joints, old or irreducible dislocations or false joints, severe sprains, relaxation of the ligaments or capsules of joints, dislocations, fistulae connected with joints, or any part of bones: dropsy of joints, badly united fractures, defective or excessive curvature of long bones, rickets, caries, necrosis, exostosis, atrophy or paralysis of a limb: extensive, deep, or adherent cicatrices: contraction or permanent retraction of a limb or portion thereof, loss of a limb or portion thereof.

CONNECTICUT NATIONAL GUARD.

Same for Connecticut National Guard, except moderate exostosis, non-syphilitic, need not reject.

XVII. THE SUPERIOR EXTREMITIES.

Fracture of the clavicle, fracture of the radius and ulna, webbed fingers, permanent flexion or extension of one or more fingers, loss or mutilation of a thumb, which as well as irremediable loss of motion does not interfere with cocking the of these parts; total loss of either thumb, finger, will not disqualify. total loss of the index finger of the right hand, loss of the second and third phalanges of all the fingers of either hand, total loss of any two fingers of the same hand.

XVIII. THE LOWER EXTREMITIES.

Varicose veins, knock-knees, club feet, splay or flat feet, webbed toes, toes double or branching, the great only moderately prominent, not extending above the knee, and not accompanied by chronic tumefaction, dropsy, or any of the toes to an extreme degree, marks of ulceration of the limb, need loss of a great toe, loss of any two toes not reject. Knock-knees, unless very of the same foot, permanent retraction marked, do not reject. Splay-feet of the last phalanx of any of the toes, cause rejection when the entire inner or flexion at a right angle of the first border of the foot rests upon the ground phalanx of a toe upon the second, with the inner part of the ankle joint with ankylosis of the articulation; in-very prominent. To disqualify, overgrowing of the nail of the great toe, riding of the toes, corns, and bunions must render the wearing of a shoe painful. Webbed toes do not disqualify unless all the toes of a foot are joined together.

Reprints and Translations.

THE TREATMENT OF WOUNDED IN NAVAL ACTIONS.*

BY FLEET SURGEON GILBERT KIRKER, R.N., M.D., M.CH., M.R.C.S.

THIS subject may be conveniently dealt with under the three following heads:

1. The surgeons station or the place where the wounded are treated.

2. The time of treatment.

3. The conveyance of the wounded.

1. *The Surgeon's Station.*—It has always been the custom to select some well protected and easily accessible part of the ship for the reception and treatment of the wounded, and to convert it, before action, into a surgical station. In the old wooden battleships the "cockpit," or after part of the orlop deck—a place below the water-line, and approached by a wide hatchway—was universally selected as the surgeon's station, and many of the scenes which have occurred there have found their way into history and art.

When the iron battleship displaced the wooden one the orlop deck and cockpit disappeared, and naval surgeons lost their prescriptive station in action. Then, on board each ship, the captain and medical officer selected the place they considered most suitable, and adapted to the chosen station the details of the necessary arrangements. It is in this way that the location of the surgeon's station is still settled; and, owing to the variations in ship construction, it must be so settled until the time comes when ships will be fitted with an

*Read before the Navy, Army and Ambulance Section of the British Medical Association and reprinted from the *British Medical Journal*.

operation room below the water line—a modern cockpit—which can be used both in peace and war.

This suggested operation room, it appears to me, should be included in the internal arrangements of every modern battleship and cruiser. It need not be large, but it should be fitted up to meet the requirements of aseptic surgery. Neither need it be particularly easy of access, for with my "ambulance sleigh" injured men can be easily and safely taken down and along all ordinary hatchways and passages. During peace important surgical operations would be done in it instead of in the overcrowded sick bay, and in it also the valuable surgical instruments and necessities would be kept in readiness for use. In time of war the surgeons, surgical instruments, and dressings would be protected in this place during action, and after action surgical operations could be done in it with more chance of success than in constantly used bathrooms or greasy mess places. The preservation of the lives of surgeons and the surgical appliances during action must receive adequate attention, if such disasters as that which occurred in the Japanese ship *Hujci* at the battle of Yalu are to be avoided. In this ship the surgeon's station was in the unprotected wardroom. Here a shell entered and exploded, killing or severely wounding the surgeons, nurses, and most of the wounded who had been brought there for treatment, and destroying all the surgical instruments and dressings. This shell also set fire to the ship, and in separating from her consorts to extinguish the fire she lost them, and was without medical assistance of any kind until the following forenoon. When the surgeons who came to her assistance got on board, they found twenty corpses and thirty-five wounded men.

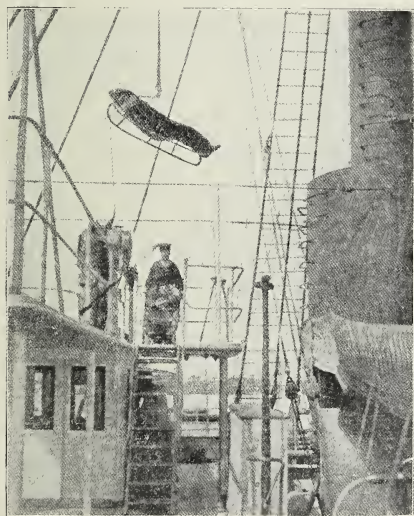
2. *The Time of Treatment.*—In all modern navies it has always been the custom in time of war, and, until recently, the intention in time of peace, to remove the wounded at once from where they fell to the surgical station for immediate treatment. It has, however, for some time been inferred that that in future naval warfare it will not be practicable to remove the wounded during an action, but that they will have

to shift for themselves until it is over or a lull occurs in the fighting; and the experience of the Japanese in their naval battles in the late war with China must be taken as demonstrating that this inference is correct, and that the practice of the past must be abandoned.

Of course, the conditions that have brought about this proposed revolution in the treatment of naval wounded are connected with the construction of modern ships and the nature of modern



THE AMBULANCE SLEIGH.
USED AS A SLEIGH AND AS A WHEELBARROW.



THE AMBULANCE SLEIGH.
USED IN SWINGING PATIENTS OVER THE SIDE AND AS
A WHEELBARROW.

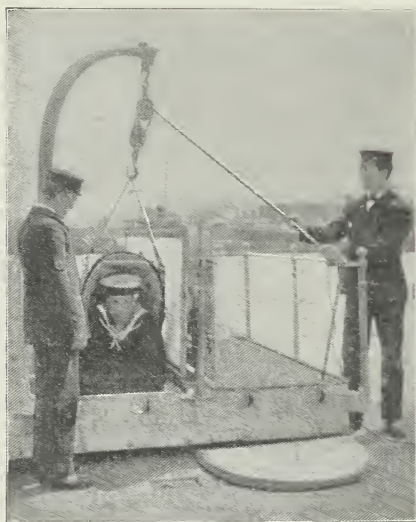
fighting, but there are also other conditions which though by themselves would not justify a departure from the old custom, yet show that the new intention is not so inhuman as it would at first sight appear. Thus the duration of a modern naval action is short, the wounds are rarely attended with dangerous bleeding—not so often as in the days of solid projectiles—there are few suitable places on board a ship where the wounded would be safer than where the bulk of the

men are fighting; and during an action, as the Japanese found, the surgeons are not able to do work of any value. M. Fontan, *Médecin en chef de la Marine de France*, in a paper which he read at the International Medical Congress in Paris in 1800, stated that it had been practically decided in the French Navy not to attempt to give treatment, altogether illusory, to wounded during action. The men should receive an elementary instruction in how to assist themselves, and a goodly supply of stimulating and restorative drinks should be provided before the action began.

3. *Conveyance of Wounded*.—Though the wounded may be allowed to remain where injured during an action, when it is over they will have to be moved either for treatment on board their own ships, or, what will be better if obtainable, discharge into hospital ships.

For the conveyance of sick and wounded men on board ship, both in peace and war, many contrivances have been proposed and used, but except the service cot, stretcher, and ambulance hammock, none

has received official recognition. As far as I am aware, this is also the state of matters in all foreign navies except those of France and Chili, in which M. Auffret's *gouttière métallique* has been adopted. The Japanese during their war with China were only provided with the ordinary appliances I have mentioned, and, as might have been expected, they found these useless under the conditions of war. They threw them aside, and carried



THE AMBULANCE SLEIGH.
HOISTING PERPENDICULARLY THROUGH A HATCHWAY.

the wounded by hand alone. This method, however, has two great disadvantages—the large number of men required to carry the wounded, (four for each) and the great danger of aggravating the injuries, especially when there is fracture of the bone.

An ambulance to be suitable for use on board ship must satisfy several conditions. It should be able to retain its occupant safely in all positions, from horizontal to perpendicular—it should be able to go down a hatchway by sliding down the ladder, if there is one, or by being lowered at any angle, if there is none; it should be as short as possible in order to get easily round corners; and in confined spaces, where there is not room for two men to carry it, it should be transportable by one.

As far back as 1896 I brought under the notice of the Naval Medical department an apparatus which I had invented to meet these conditions, and which I now call an “ambulance sleigh.” Not meeting with approval when brought forward, on account of its size and weight, I allowed it to lie aside for fourteen years. Last year, when attending the International Congress at Paris, I became aware of the existence of M. Auffret’s *gouttiere metallique*, which has lately been introduced into the French and Chilian navies, and on which its inventor began to work in 1892. This apparatus I was surprised and pleased to find was constructed much on the same plan as my ambulance sleigh, except that it lacked the distinctive and most valuable sleigh characteristic of my apparatus. On returning to England I resurrected my old invention, lightened and improved it, and it is now undergoing official trial.

The illustrations demonstrate its suitability for all the necessities of the transport of wounded or helpless persons, on board present-day men-of-war with fighting tops, narrow passages and hatchways, and ammunition hoists. It will be seen that it can be slung or suspended, carried as an ordinary stretcher, wheeled barrow fashion on castors at the ends of the carrying handles which are hinged so as to fall back under either end of the cot to permit of its being trundled along the

deck or passage ways, slid on its sleigh attachments down ladders or other inclines, or suspended from the head end perpendicularly; for lowering down narrow hatchways, etc., the occupant being securely held in the cot by means of the perineal support and three broad belts strapped across body, thighs, and legs respectively. The floor of the cot also slopes down from the head to the perineal support, rises from there for the thighs and falls again from the knees to the feet. The original objection to its weight and size has been to some extent surmounted; it now weighs 35 lbs., measuring 7 feet 2 inches long when carried as a stretcher, and 6 feet 2 inches when the handles are folded back; its breadth is 21 inches at the head, 18 inches at the foot; the weight includes the cushion or mattress lining of cot. Possibly its weight might be further reduced by the use of aluminium in place of steel or iron in the construction of the cot frame, etc., combined with bamboo or rattan work. As stated above an almost similar appliance has been adopted in the French and Chilian navies, and it would appear well adapted to many circumstances in civil life, as in mines, collieries, etc.

To make more complete my reference to the conveyance of wounded on board ship, I must mention some of the other contrivances which have been from time to time proposed. Among them are modifications of the service hammock (Macdonald), cot (Gihon, Gorgas and Loyd), and stretcher (Dick), and Mowl's patent chair.



SOME REMARKS, BY WAY OF CONTRAST, ON WAR SURGERY OLD AND NEW.*

BY SIR WILLIAM MAC CORMAC, BART., K.C.B., K.C.V.O., M.A.
M.Ch., LL.D., D.Sc.

LONDON, ENG.

ON October 1st, 1856, Mr. M'Whinnie, assistant surgeon to St. Bartholomew's Hospital, delivered the introductory address at that institution. In the course of it he referred to the Crimean War, and many of his remarks are applicable now. He said that, "although the military surgeon enjoys certain advantages which the events of the late war promise to render greater, we must not conceal the fact that military surgeons have not yet attained the position to which their varied acquirements, skill and devotion, fairly entitles them." Speaking of the return of the victorious regiments and the enthusiasm which accompanied their triumphal entry he called to mind the glorious part our own professional brethren had taken in the struggle, and that the surgeons had, as in preceding wars, distinguished themselves by their skill, devotion, bravery and humanity. He quoted Colonel Ambert, a French colonel of dragoons, who had used in October, 1854, generous and eloquent words in describing the qualities of the medical officer. "In the hour after the battle he will be chief among the multitude, during the fight calm, when all around is agitated and disturbed. In an atmosphere of grape shot and smoke he must deny himself all emotion. The shrieks of the wounded, the booming of cannon, and the crash of shells, do not disturb him—all ranks appeal to him for help, and he gives it alike to the poor soldier or to the mighty general, to the fallen amongst the enemy, and the wounded of his own army.

*Remarks before the Navy, Army and Ambulance Section of the British Medical Association and reprinted from the *British Medical Journal*.

"After the battle the general and his soldiers hear the shouts of triumph, but the surgeon has to listen to the groans of the sufferer: night comes on and all are asleep save him, awake amongst the wounded, and next day, exhausted with fatigue, he sets out again with his ambulance, giving hope to all, improvising a thousand methods, and supplying material means of aid by the power of his intelligence and skill, honour then to him: his mission is a thousand times sacred.

"Fellow citizens, you who were so moved at the heart-rending sufferings of your soldiers in the East, the military surgeon has saved your sons, though he may himself have died at his post, and the heroism of science has equalled, if it has not surpassed, the bravery of the field of battle."

Mr. M'Whinnie pointed out that "from evidence given before Parliamentary committees, and other undeniable testimony, it was clearly shown that the blame attached to the medical department at the beginning of the Crimean campaign was undeserved, and had the hygienic measures suggested by its members been carried out the losses and sufferings of the army would not have been greater than those which attend the ordinary casualties of war, and that when the injunctions of our military brethren were attended to the health of our troops soon became most satisfactory."

Dr. Balfour—then of the Royal Military Asylum, Chelsea, whose authority is entitled to the greatest attention and respect—writes that "so far as I can learn from competent judges there has been an amount of good surgery, which surpassed the anticipations of even the best friends of the department, and I believe we are far ahead of the French army in that respect."

The wars which compare with that in South Africa in regard to length of the struggle, numbers of wounded, and strain upon the Army Medical Department are the Peninsular and Crimean wars, the American war of the Rebellion, and the Franco-German war.

Many lesser campaigns have intervened, such as the Egyptian and the Indian wars, and the struggle between China

and Japan, but these are not epoch-making like the other great wars, and do not constitute milestones along the march of military medical progress. In considering this question, we must also remember there is much concerned beside the mere treatment of wounds. There is the organization of the Medical Corps, the improvement in the means of transport of sick and wounded, the formation of hospitals, and the commissariat supply.

We scarcely remember it now, but chloroform was first tested on a large scale in the field during the Crimean campaign, and its success was complete. Macleod says there was but one death which can fairly be said to have arisen from it. Baudens tells us that chloroform was administered some 25,000 times in the French army, and that no fatal case had occurred.

It was found even more precious in the field than in civil practice by relieving shock and permitting many primary amputations which could not otherwise be performed. Fewer assistants are required when it is employed, which materially adds to its value. Mr. Blenkins, of the Guards, remarks that without the aid of chloroform many severe operations could not have been undertaken or performed at all.

The next great war was that of the American Rebellion, and the records of its results are to be found in the monumental volumes issued from the Surgeon General's office.

In the Austro-German war of 1866 antiseptic surgery had not been introduced, nor was it employed during the Franco-German war of 1870-71, except to a quite limited extent upon the German side.

The mortality after operation was then very great indeed on both sides, and especially in the French army. All kinds of infective diseases prevailed—septicæmia, pyæmia, and tetanus were common, most indeed of the operation cases died pyæmic, suppuration was universal, gangrene and secondary hæmorrhage were frequent. Wounds of large joints entailed fatal results, abdominal wounds were scarcely ever recovered from, and one-half or more of the cases of chest injuries died. Fractures of long bones were always very serious, especially

those of the femur; amputations were frequent, and attended by a large mortality; while excisions of joints, in the lower limb at all events, were most unsatisfactory, if performed as primary operations. A very large proportion of those who died on the field of battle, if not killed immediately perished from hemorrhage. Operations, however, were almost invariably performed with the assistance of chloroform, and an infinite amount of suffering was thus saved.

The large bullets of former campaigns, weighing often twice as much as those now in use, inflicted most extensive damage both on the soft parts and the bones, the comparative magnitude of the injury and the imperfect means of guarding against sepsis offer a sufficient explanation of the high rate of mortality.

In the war between Russia and Turkey a systematic attempt was first made by Professors Bergmann and Reyher to treat gunshot wounds of the knee antiseptically with very great and, at the time, astonishing success. In the campaign in Egypt in 1882 antiseptic methods were so effectively carried out that there was not throughout a single case of erysipelas, pyæmia, or septicæmia, or of any infective preventable disease.

I do not mean in this brief communication to enter into minute details or to give you many statistics—indeed, from South Africa there are as yet no complete ones available. I would only seek to indicate in a general way some of the improved conditions of modern warfare as exemplified in South Africa.

The use of chloroform was universal, and that not less blessed agent in relieving pain, morphine; in this way the detrimental influence of shock was much lessened. But shock is less severe in the case of the modern bullet than previously was the case, due no doubt to the different character of the wound.

The limited amount of local damage produced in most instances by the comparatively small and very swift Lee-Metford or Mauser bullet has impressed all observers. The normal external wound is circular and quite small, like the end of

an ordinary pencil, and it soon became sealed with a black scab of dried blood. The exit wound is often quite similar, or like a small slit, and closes in the same way. The soft parts and bone are damaged as a rule in a limited degree, and recovery generally took place rapidly and without complication.

The bullet seems to be itself aseptic; clothing is very seldom carried in with it; the bullet track behaves more like an incised wound than a contused one; the rapid manner in which the small external wounds seal up reduces the injury to the subcutaneous form, and the frequency of recovery is proportionately great.

The manner in which the bullet may traverse the abdomen, thorax, cranium, the great joints, and important viscera, not only without entailing a fatal result, but often producing only a minimum of constitutional or other disturbance, must be witnessed to be realised.

I was much impressed with the small number of cases of primary fatal hæmorrhage and the large number of traumatic aneurisms. The large vessels, even including the innominate artery, may be wounded by a bullet without causing fatal bleeding, and often with a surprisingly small amount of hæmorrhage either external or internal—a totally new experience.

In the Crimea and in the Franco-German war the estimated proportion of deaths from primary hæmorrhage on the field of battle was about 20 per cent., and it was thought beforehand that the small hardened bullet would probably greatly increase the number, but this is not true, and in South Africa and in the Cuban war death from this cause was found to be comparatively rare. The same comparative infrequency may be stated in respect of secondary hæmorrhage.

Wounds of the blood vessels are generally followed by aneurismal swellings sometimes arterial, more frequently arterio-venous. The treatment of these cases is difficult, and many I am convinced should if possible be left alone. Unless immediate interference is indicated by some urgency such as fresh hæmorrhage, pressure symptoms, or impending gan-

grene the longer the interval permitted before operation the better the prospect of ultimate success; besides, some cases get well spontaneously. In those operated upon the ligation of the vessels at the seat of injury remains for most cases the classic and safest treatment, but it is often attended by the greatest difficulties and often followed by gangrene.

The treatment of the larger proportion of Mauser wounds is generally of the expectant kind, and of none may this be more correctly stated than of wounds involving the abdominal cavity.

Many surgeons went to South Africa anticipating a large field of surgical enterprise in this direction, but I feel sure the surgical records of the campaign, when published, will prove the advantages of non-interference in the greater number of instances, and this has also been the experience of the American surgeons in the war with Spain where the weapons used were precisely similar. There all the abdominal cases but one operated on died, while many treated expectantly recovered, but the general mortality was as high as 70 per cent. of the total, while in the Civil War the mortality reached 87 per cent. The liver, kidneys, and spleen may be perforated and yet recovery ensue. The large intestine, and, I believe, the small intestine also, must have been frequently perforated without fatal consequences. The small perforation caused by the Mauser bullet and the frequently empty condition of the bowel are the principal factors to account for a non-fatal issue.

In every region of the body the percentage of cases terminating fatally is diminished. Formerly a gunshot fracture of the femur formed a serious menace to life, and determined not infrequently an immediate amputation. In the Civil War of 6,576 fractures of the femur nearly 3,000 (2,923) were treated by primary amputation, and the mortality following the injury amounted to 50 per cent.

In the Spanish-American war, of 82 cases of gunshot of femur 6 only were amputated, while 74 were treated conservatively. We do not yet know the mortality results in South Africa, nor do I know of any uncomplicated cases of gunshot

fracture of the femur treated by primary amputation. I fancy there must have been very few. Recovery was looked upon as the ordinary result, although union was often considerably delayed, and the risk to life and limb was increased the higher up the fracture; while possibly 15 to 20 per cent. were amputated for various causes later on. I think the record of this war will show amazingly few primary amputations for injury, but a certain number had to be performed at a later period on account of septic conditions.

The way in which many perforating wounds of one side or both sides of the chest recovered was nothing short of marvelous. Very often the most trivial inconvenience was the result—trifling dyspnoea, perhaps, or hæmoptysis, which was often absent and frequently insignificant, and complete recovery followed in a few days. In other cases there was more or less hæmothorax, and in a few pyothorax; what the ultimate mortality table may show we do not yet know, but it will not be very large. In the Franco-German war half the cases terminated fatally, and in the Civil War the mortality was as high as 62.6 per cent.

It may be taken as proved that a Mauser or Metford bullet may traverse the knee and other articulations and fracture the bones, entering into the joint without causing any risk to life or limb, or even any permanent disablement. The old difficulty as to amputation or resection did not arise, the treatment was expectant, suppuration was rare, and when passive movement was commenced sufficiently early excellent functional results followed.

In the sketch to which I have limited myself, I think enough has been said to show how completely the character of gunshot injuries is changed. Their severity is not only diminished, but also their relative frequency, so that the progressive improvement in lethal weapons does not appear to render the prosecution of war more difficult, or to render it impossible as some have recently contended.

In the American Civil War 1 man was killed for every $4\frac{1}{2}$ wounded, while with the Mauser bullet the proportion of

killed to wounded is 1 to 7½. Only 6 to 8 per cent. of those wounded now die, whereas in the Civil War the percentage was 14½; this is due, no doubt to the altered character of the injury, and also, in no small measure, to improvements in the method of treatment.

It has often been forgotten what a complete change there is in the battles of this present war from any that have gone before. Stress is placed upon our losses, but they are almost insignificant in comparison with those of former times. In the Crimea they reached nearly half our strength. There was no trained transport corps, nor hospital service, nor adequate system for the care of the wounded on the battle field at the beginning of the war, and numbers died on board the ships transporting the sick and wounded to Scutari in consequence of the inadequate preparation, although it is a journey of only 36 hours.

Now the enemy is for the most part unseen, and the smokeless powder fails to give any sign of his whereabouts. At some of the earlier battles—that of Colenso, for instance—the Boers were invisible during the entire day; not a single Boer was seen by our men, and the result was that the enemy only lost 5 killed and 25 wounded; while on our side there were 1,100 casualties.

What a contrast is this to the early battles of the Franco-German war, with their brilliant cavalry charges and their masses of men hurled at the objective, without heed of the loss incurred; they were literally decimated. At Gravelotte, on August 16th, 1870, each side had 16,000 men placed *hors de combat*. On the 18th, two days later, occurred the terrible struggle of St. Privat, where 120,000 French were pitted against 180,000 Germans. The artillery, the mitrailleuses, chassepots and needleguns, plied against one another in the open. Five times Steinmetz's sharpshooters were driven back, and many corps lost half their officers. The Prussians were repeatedly repulsed with fearful loss, and at 7 in the evening Bazaine and his officers considered the field was won. But at 9 the Prussians again attacked, and in the early morning the

Royal Guards advanced up the exposed slopes of St. Privat against Canrobert.

They assaulted one position after another in superb fashion, but the slaughter was dreadful; almost all the principal officers were struck down, the colours exchanged hands several times, and 160 German officers and 4,000 soldiers were laid low in the attempt. Nevertheless the Germans poured in regiment after regiment, 14 Saxon batteries of artillery were added to the ten Prussian ones, and as the sun was setting, the Saxon regiments of the Guard, drums beating and trumpets calling, rushed at the double on Canrobert's forces; there was fighting in the streets, in the houses, in the cemetery, man to man with bayonet and butt end of musket, and the place was taken.

The French lost that day 12,000 men and the Germans more than 20,000, amongst them the flower of the army, for the Prussian Guard had 300 officers and 8,000 soldiers either wounded or killed. One of them was Langenbeck's son, who told me he had spent many long hours in search of him only to find him mortally wounded.

The Germans nearly lost the battle, and would certainly have lost had Bazaine come to the assistance of his colleague. He heard the guns, and was informed of the situation by Marshall Lebouef, yet he never left his office at Plappeville. Soon afterwards Moltke's supreme knowledge shut him up helpless with 170,000 men in Metz, and a little later, on October 29th, Metz la Pucelle and all this great French army was forced to surrender.

In some of the great Napoleon's battles as many as 38 per cent. were disabled; at Waterloo the number was 24 per cent. At Koeniggratz, the bloodiest battle of the war of 1866, it was 7½ per cent. At Mars le Tour it was 16 per cent., and at Sedan 12 per cent. I was there that day, September 1st, 1870, when the French lost 3,000 killed and 14,000 wounded—not very far short of our total loss for the entire period of the war in South Africa.

During twenty-one months of this war, from the beginning up to the end of June, 4,355 officers and men have been

killed in action, 18,291 were wounded, and 1,493, or 8.1 per cent., of the wounded died.

Modern troops in the field are now supplied with a packet of antiseptic material called a "first field dressing." It is hermetically sealed, and carried in a special pocket in each soldier's jacket. If a surgeon be near, he applies the gauze contained in the packet to the wound, and fastens it on with the bandage supplied; or the wounded man himself does it, or his comrade for him, as every man is taught its use and application. It certainly helps somewhat, and comforts the wounded; but I do not myself much believe in its antiseptic adequacy, and it often slips out of place.

Later on the Roentgen rays are of great service; they localise the foreign body when lodged, and determine the extent and direction of a fracture. They should serve to abolish the use of the probe, which is a fertile cause of mischief and of needless pain and suffering.

Before the regimental system ceased to be each regiment had a surgeon-major, and two assistant surgeons. In time of peace there was very little for them to do except to look after a few sick in the regimental hospital. In time of war they accompanied their regiments into action as at Waterloo and in the Crimea, and tended the wounded, often under fire. When the regiment moved on the wounded had perforce to be left behind to the chance care of such persons as could be found to look after them, and there was practically no organised system of transport, field hospitals, and bearer companies.

The organization of the transport of wounded from the field to the field hospital, and thence to the stationary and base hospitals, is now very complete, and worked well in South Africa. Formerly the wounded might have to lie for days untended, now they are looked after with the least possible delay, and passed along the continuous relief chain from the front to the base with a minimum of hardship and delay. I myself saw many who had been exposed after Sedan for three or four days, and some were even longer, without any succor.

The hospital ships and hospital trains are comparatively

new departures, and of immense value in modern warfare. The ships were, I consider, something as near perfection as anything human can be, and the hospital trains did splendid work. One officer I knew—Major Brazier-Creagh—lived for twelve months in one of these trains, almost constantly on the move. During the period of twelve months and six weeks that Major Brazier-Creagh commanded this train he conveyed 16,485 officers and men from the battlefields and along the lines of communication, covering a distance of 34,473 miles. The train was several times under fire, and was shelled on two occasions. It was also in collision, and more than once in imminent risk of being wrecked by the Boers; and the Princess Christian Train made 102 journeys, carried 7,000 patients, and traversed over 30,000 miles up to June last, and is still at work with the same staff of surgeons and nurses on board as at the beginning.

At the battle of Colenso before the firing had ceased, a hospital train was loaded with 120 wounded men, every one of whom had been previously dressed and otherwise attended to by the bearer companies. This train, with its occupants lying comfortably in their cots, was soon speeding on its way to the general hospital at Maritzburg. A few days later these and other wounded men were sent on to one of the hospital ships, provided with every medical and surgical requirement and luxury, awaiting their arrival at Durban. Many thus found themselves aboard ship, in a swinging cot, in the fresh sea air, a couple of days after they had been wounded some 150 miles inland. What a contrast to the incidents which took place in the Crimea and on some battlefields in India, where the wounded had often to be left for days upon the field, being frequently plundered and sometimes killed by murderous thieves amongst the camp followers!

DISCUSSION.

DR. FARQUHARSON, M. P., congratulated the section on having had the opportunity of hearing from a surgeon of Sir William MacCormac's unique and varied experience the results of military surgery in South Africa, in comparison with

those in previous campaigns. His address formed a complete and forcible vindication of the Army Medical Department and their admirable work in South Africa under conditions of exceptional difficulty and danger, and at times when the society globe trotters, who afterwards posed as critics, were comfortably in bed after a good dinner. This work had been insufficiently appreciated, and the department had felt rather strongly that their proceedings had been specially subjected to hostile criticism, and that it was thought necessary to appoint a commission to make inquiries, whilst the purely military side of the campaign had hitherto escaped hostile comment and investigation. The commission was composed of able and trustworthy men, who took a calm, judicial, and dispassionate review of the situation, and it was unjust, cruel, and even libellous to characterise their report as a white-washing one. Reading between as well as on the lines, they found some emphatic condemnation of the insufficient appreciation by the Government of the difficulties of the situation, but at the same time they praised highly the skill, devotion, and humanity shown by the army doctors under conditions of absolutely unprecedented difficulty. Undermanned as they were, compelled to attend vast numbers of sick and hurt, encountering overwhelming difficulties of transport and hospital accommodation they still attained results unknown in previous warfare. The climate had something to do with this, as well as the Mauser bullet, but much was due to the early antiseptic dressing on the field, as well as to the skill and care with which the wounded were afterwards treated.

FLEET SURGEON G. KIRKER, R. N., said he had listened with great pleasure to the very interesting and instructive address of his distinguished countryman and townsman, Sir William MacCormac. He did not propose to refer to Sir William MacCormac's paper further than to observe that it showed the great difficulties with which the R. A. M. C. had to contend and the splendid results which in spite of these difficulties they achieved. With the permission of the Section he wished to refer to a somewhat personal matter, in connection with the nature of modern small-bore bullet wounds, a subject which Sir William MacCormac shortly treated. Through Sir William MacCormac's instrumentality he had the opportunity of observing bullet wounds in the Russo-Turkish war of 1877-78, and he presumed to regard himself as the prophet of the humane character of modern bullet wounds of which they heard so much now. In Turkey he saw compound fractures of the thigh which healed without suppuration, perfo-

rations of the knee-joint which healed without trouble, and cases of penetration of the chest from side to side which recovered without a bad symptom. When he returned home he made experiments on the subject of rifle bullet wounds, and based on these observations he brought forward the then new doctrine that rifle bullet wounds were less severe than round bullet wounds, and would be the more so the more their peculiar characters—especially smallness of diameter and hardness—were accentuated. He also pointed out that the splendid results, especially in the treatment of penetrating wounds of the knee-joint in the hands of Dr. Reyher, which were attributed to anti-septic treatment, were to a great extent probably due to their being produced by rifle bullets. A similar remark had recently been made by surgeons who had been out in South Africa, and several characteristics of small bore rifle wounds had been brought forward in connection with the South African war which he brought forward twenty years ago. His papers on the subject were one in the Transactions of the International Medical Congress of London, 1881, and another read at the meeting of the British Medical Association in Belfast in 1884 and printed in the *British Medical Journal* in the following September.

SURGEON GENERAL O'DWYER pointed out that with a force extended over a frontage of three miles, as was the case at Waterloo, it was much more easy to remove the wounded promptly than when they are scattered over an advance extending over twenty miles—and Lord Roberts informed the troops at Bisley the other day that future wars against troops armed with modern rifles must be in the very extended formation. It would require a great increase of medical *personnel* as well as of the transport for medical purposes. Surgeon-General O'Dwyer fully corroborated Sir Wm. MacCormac's experience as to the benign character of the modern small-bore bullet. He also pointed out the difficulties the medical service had to contend with in improvising *personnel* and equipment only intended to be sufficient for a force of 70,000 men to suffice for a force of 200,000, for it appeared from the evidence given by the Chief Ordnance Officer at Woolwich Arsenal as given before Mr. Justice Romer's Committee that after the hospital equipment for the first two army corps 70,000 men had been despatched, only one general hospital and three stationary hospitals remained in store to meet the requirements of the remaining 130,000 men added to the South African field army.

SURGEON GENERAL HAMILTON commented on the various

forms of bullet that had been in use in the British army. Commencing with the original spherical, and passing on to the Minie, the Enfield, the Snider, with its expanding, indeed almost explosive bullet, the Martini, and finally the Lee-Enfield of 0.303 bore. He alluded to the great penetration of the present bullet, deprecating in the strongest terms the use of expanding bullets, and proposed a motion on the subject.

SURGEON MAJOR POOLE said his experience of the South African war had been gathered from his connection with the Soldiers' Help Society, and pointed out that the worst cases of injury had been from the use of explosive bullets; the present bullet was comparatively harmless—men coming to his study for help to work who had had a bullet entering one side of the head behind the ear and passing out at the right eye, whose appearance and behaviour had been that of happy individuals.

SURGEON GENERAL HARVEY (Director General I.M.S.) thought that in justice to the Government of India he should mention that the first field dressing had been used in all recent Indian campaigns. The surgical results of these campaigns had been excellent; in the second Mirangui expedition of 1891 less than 3 per cent. of the wounded had died, and the proportion of deaths among the wounded in the Tirah campaign was very small. He entirely agreed that in fighting with a civilized enemy the use of expanding bullets should be absolutely prohibited, but in the case of savage foes who were determined to kill their enemy though they died for it, the case was different. A fanatical Ghazi was not checked by the modern bullet, which went through him like a knitting-needle through a pat of butter, and it seemed to him quite legitimate to stop him by any means necessary, including the Dum-dum bullet. It was false humanity to allow our own men to be killed rather than to take means to effectually prevent this by disabling the enemy.

MR. J. W. SMITH (Manchester) said that from his experience in the South African campaign he wished to support the conclusion enunciated in the paper. He regarded the first field-dressing as somewhat ineffectual either as an aseptic or antiseptic agent, and attributed the aseptic course of wounds rather to the nature of the wound and atmospheric conditions than to the dressing. Some better means of fixing the dressing should be devised.

[Surgeon General Harvey's observations on the advantages of the Dum-dum bullet in war with savage and fanatical foes were approved by the Section, and Surgeon General Hamilton's motion deprecating such bullets was not entertained.]

THE INFLUENCE OF COLOUR UPON ANOPHELES.

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IN PURSUING our Studies in Relation to Malaria, which are appearing in the *Journal of Hygiene*, my colleague, Mr. A. E. Shipley, and myself thought it desirable, amongst other things, to study the influence of colour upon *Anopheles maculipennis*. From what is known of the behaviour of other insects to colour, and occasional hints we have obtained from observing the behaviour of *Anopheles*, we had concluded that we might, as the result of our experiments, obtain results having a definite practical bearing.

It seemed to us to be a matter of considerable practical utility to determine what influence, if any, colour exerted upon a known malaria-bearing species of mosquito; and we deem our results sufficiently striking to make it worth the while for those who are engaged in similar studies abroad to take the matter up systematically. Our experiments certainly indicate that *Anopheles maculipennis* is attracted by some colours and repelled by others, a matter which would have its practical application in the choice of the colour of clothing and the interior of rooms in malarious districts.

The preference of *Anopheles* for dark and shady places, whither they retreat during the daytime, has been noticed by a number of observers. The behaviour of the insects towards various colours has not as yet received sufficient attention. Whilst engaged upon our experiments we came upon a few data cited in the recent literature.

Austin¹ writes: "If the walls of the room be whitewashed

with a dark dado, it is interesting to note that the insects will always be found upon the dark strips, and never on the white portions of the wall." Buchanan² in India noted that "the men who collect the living *Anopheles* say that the *Anopheles* hide in a black coat, but avoid a white coat, so they hang up one or two black coats in the hospital ward" when they desire to catch the imago. Neither Austin nor Buchanan say anything about the influence of colour. The first, as far as we know, to refer directly to the influence of colour is Joly³, who made observations on mosquitos in Madagascar. He states, without saying what genus, that "mosquitos" there were more attracted to black than to red soil or to white sand. Persons wearing black shoes and socks were more bitten than when these articles of apparel were white. Brown clothes protected less than those of white or blue. He states that the natives of Madagascar know the attraction black offers to mosquitos, and for this reason hang up a black cloth on the rafters of the room for the insects to collect upon. Joly observed that a yellow-haired dog was very much less bitten than a black one. For the same reason the natives are more bitten than the whites, although they suffer less from the after-effects.

Our experiments were made in a large gauze tent, which had been erected within a disused photographic establishment, the one end of the tent ending against large windows, into which the sunlight poured on bright days. Large stone basins were placed on the floor for the *Anopheles* to breed in, the stock being renewed from time to time.

It was noticed at the beginning that when one entered the tent in dark grey clothes the imagos frequently flew up and settled on the dark cloth, but that they never did this when the person entering the tent was clothed in white flannels. To test the influence of colour, a number of pasteboard boxes were taken which measured 20 cm. by 16 cm. and had a depth of 10 cm. The boxes were lined with cloth, having a slightly roughened surface, to which the insects could comfortably cling. All of the fabrics had a dull surface, and each box was lined with a cloth of different colour. The boxes

were placed in rows upon the floor, and upon each other in tiers, the order being changed each day after the observations had been made. The interior of the boxes was moderately illuminated by light reflected from the surface of the white tent. On seventeen days during a month, beginning with the middle of June, we counted the number of flies which had accumulated in the boxes. Counts were actually made on seventeen sunny and cloudy days, and with the following result:

Colour of Box	Number of <i>Anopheles maculipennis</i> Counted in each Box during	
	Seventeen Days.	
Navy blue.....	108	
Dark red.....	90	
Brown (reddish).....	81	
Scarlet.....	59	
Black.....	49	
Slate grey.....	31	
Dark green (olive).....	24	
Violet.....	18	
Leaf green.....	17	
Blue.....	14	
Pearl grey.....	9	
Pale green.....	4	
Light blue (Forget-me-not).....	3	
Ochre.....	2	
White.....	2	
Orange.....	1	
Yellow.....	0	

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We see from the above table that dark blue was most attractive, the other colours being less and less attractive in the order of numbers given. A marked fall in the number of insects resting in the boxes begins with the "blue" box; the colour in this case was a rich full blue. Pale green, light blue, ochre, orange, and yellow, especially the last two colours, seemed to repel the insects.

The khaki uniform at present in vogue should therefore offer advantages besides being invisible to the human enemy. It is of course true that the *Anopheles* bite more frequently during twilight and at night, but the choice of clothing having a repellant colour should afford a measure of protection against the insects which may bite during the daytime. In any case, the number of insects congregating in dwellings

might very well be lessened by the choice of colours of a suitable character applied to the walls. It has also occurred to me that some sort of a trap might readily be devised, lined with a suitable colour, such as dark blue, within which the insects would congregate and easily be destroyed in considerable numbers. Our experiments with boxes have been so striking that such a plan immediately suggested itself. Unfortunately for the experiment we are not living in a country where *Anopheles* are numerous, so we will hope that those who are placed in more favourable circumstances will make the attempt to see if colours can be made to afford a practical means of protection.—*British Medical Journal*.

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THE PHYSIOLOGY OF MARCHING.*

BY DR. ZUNTZ AND DR. SCHUMBERG.

A SERIES of important works dealing with medico-military subjects has recently been initiated in Germany by the issue of a volume on the physiology of marching by Drs. Zuntz and Schumberg. The authors utilized in the investigation of their subject six students, who were set to march in uniform, carrying the usual military accoutrements. It will be interesting to summarize the main observations and conclusions. With regard to the circulatory system, it was found that severe marching shortened diastole, lengthened systole, lessened the systolic expansion of the arteries, and increased diastolic pressure. Marching with a load of 18 kilos. lengthened the systolic time by 30 per cent., while a load of 31 kilos. lengthened it by 55 per cent. The prolongation of the systole was regarded by the authors as a sign of cardiac fatigue. The frequency of the heart beat was increased, and might reach 150. Tachycardia and prolongation of systole was accompanied by dilatation of the heart and congestion of the liver. An increase of the load from 22 to 31 kilos. markedly increased the enlargement of the heart and liver. In 50 per cent. of cases the left side of the heart was dilated as well as the right. The venous congestion and consequent enlargement were brought about partly by the pumping action of the skeletal muscles, partly by cardiac fatigue, but chiefly by fatigue of the respiratory pump. It was found that when the respiration was impeded by too heavy a load it became shallow and frequent. The vital capacity was strikingly diminished, in one case by 21

**Studien zur einer Physiologie des Marsches* (On the Physiology of Marching). Von Dr. Zuntz und Dr. Schumberg. Berlin: A. Hirschwald. 1901. (Demy 8vo, pp. 370. M. 8.)

per cent., and the average vital capacity without load was found to be 3,436 c.cm., with load 3,220 c.cm. The vital capacity was far more reduced in the raw recruit than in the trained soldier, and varied inversely as the frequency of respiration. Zuntz and Schumberg conclude that after a rest of a quarter of an hour the frequency of respiration should not exceed the normal by more than 30 per cent., during the march by more than 75 per cent. This is a practical test which can be applied by any officer. Shallow, quick respiration leads to venous congestion, and this in its turn leads to a rise of body temperature.

The temperature was measured in the urine. With a load of 22 kilos., and marches of 15 to 20 kilometres, the temperature even in tropical heat did not rise above 37° C. It was raised to 38° C. by a load of 31 kilos. and a march of 25 kilometres. After the debauch of a birthday celebration the temperature in one case reached 40.5° C.

The specific gravity of the blood was found to be raised, and the number of red corpuscles increased by 9 per cent., but these changes were, however, only temporary. The concentration of the blood is not due to sweating alone, for in the active muscles the osmotic pressure is raised by 50 per cent. The muscle fibres thus become turgid with water. The loss of water from the blood is counteracted by the withdrawal of tissue lymph into the circulation. This is brought about by vaso-dilatation and the pumping action of the contracting muscles. The number of polynuclear white corpuscles was found to be temporarily increased, but this was not due to new formations, and the conclusion drawn is that marching produces no permanent effect upon the blood of a normal man.

The specific gravity of the urine was found to be lowered, and owing to diuresis and to sweating the fluids of the tissues became more concentrated. Albumen and casts were observed after short, excessive muscular efforts, but never after severe marching. An increase noted in the output of calcium and phosphoric acid suggests the wear and tear of bone, for it was out of proportion to the output of nitrogen. There was no

increase in the output of ammonia. The increased output of nitrogen due to marching accounts for 6 to 7 per cent. of the total energy expended, and it was observed that very hot weather made the nitrogenous waste greater. If the muscular work be excessive the blood supply fails to keep up with the needs of the muscles, and destruction of muscular tissue then occurs and long-lasting lessening of functional power. Such is the result of over-training.

The soldiers were clothed in specially washed garments, and after the march the amount of nitrogen in these clothes was estimated. The authors calculated that as much as 12 per cent. of the nitrogen given off in the urine and fæces may may be given off in the sweat during hard work (284 mg. N. per litre). Increases in the nitrogen output in the sweat seemed to be due rather to hot weather than an increased load. By remeasuring the respiratory output of carbon and water, and deducting the weight of the excreta from the total loss in bodily weight, the authors ingeniously reckon the output of sweat. For every 1,000 calories of energy expended in marching they reckon that about 800 grams of water are evaporated. The effect of atmospheric conditions, dryness, wind, sun, and the effect of load were investigated and calculated. A man weighing 70 kilos. produces, when resting, 1.2 to 1.35 calories a minute; while marching with a load of 31 kilos. he produces 7.73 calories a minute. The extra production of heat is calculated to raise the body 1° C. in 8.7 minutes, and yet the heat-regulating mechanism is found to be sufficient in spite of the uniform and accoutrements. A heavy load was found to increase sweating by impeding pulmonary ventilation. Zuntz and Schumberg argue that the heat regulation depends on the sweat glands, for they studied a man who possessed no sweat glands, and found that in a hot sun his temperature quickly rose to 39° C. in spite of a doubled pulmonary ventilation. They believe that soldiers with hot, dry, dark red skin and inactive sweat glands are especially in danger of heat-stroke.

The authors insist on the importance of substituting

light, porous clothing for the absurd uniform of the past. This by allowing rapid evaporation of sweat prevents overheating of the body by day, and over-cooling by night. They conclude there is no danger in long marches in very hot weather if the soldiers are lightly loaded. The load should not exceed 22 kilos.

The full war ration in Germany contains 181 grams proteid, 64 grams fat, and 558 grams carbohydrate, yielding 3,442 calories. A diet of the same calorie-worth was given by the authors, but they found that their subjects lost weight; they lost fat, but put on muscle. The subjects of their investigation were found to expend 3,600 calories on resting days and 4,300 on marching days. The German peace ration yields only 2,611 calories. They consider that the fat ought to be increased in the diet because it spares the work of digestion. They recommend also the use of more sugar, but are of the opinion that 110 grams of proteid in the diet is amply sufficient for nitrogenous metabolism. They point out that while 1 kilo. of adipose tissue yields 8,600 calories, the same weight of muscle yields 900 calories. Thus 7,700 calories (the energy of two days' work) are set free when a man replaces 1 kilo. of his adipose tissue by muscle. Such a substitution cannot, however, take place quickly, for 33 grams nitrogen, or 214 grams proteid, must be retained out of the diet to make 1 kilo. of muscle. With the growth of muscle the authors find a proportionate increase in oxygen intake. They ingeniously calculated the proportionate metabolism of fat and carbohydrate from their measurements of the oxygen intake, and the respiratory quotient. The proteid metabolism they reckoned in the usual way from the output of nitrogen.

They found that fatigue increased the rate of expenditure of energy, and that lameness due to pain in the tendons of the foot increased waste most strikingly. It would, they say, be uneconomical to work a lame horse on account of the amount it would eat! As a result of training there is more perfect co-ordination, fewer muscles are used, and work is done more economically; thus a riding horse carries a man

with markedly less expenditure of energy than a carriage horse. Excessive heat with a light load increases the expenditure of energy much more than a heavy load on a cold day. Loads increase expenditure in proportion to their weight, but if properly distributed over the body have remarkably little effect. The load should be placed so as to disturb the centre of gravity as little as possible, and should be so arranged on each side of the body as to balance the disturbance at one step by that at the next.—*British Medical Journal*, Aug. 10, 1901.

ASSISTANCE TO PRISONERS OF WAR BY RED CROSS SOCIETIES.

A PAPER upon this subject was presented by M. Romberg Nisard, at the Congress on *Œuvres d' Assistance en temps de Guerre*, held in connection with the Paris Exhibition of 1900. The late M. Romberg, father of M. Romberg Nisard, had been instrumental in founding during the Franco-German War the *Société Internationale de Secours pour les Prisonniers de Guerre*, and he never lost an opportunity of keeping the subject before the public while he lived. On the outbreak of hostilities between the United States and Spain, he presented a memorial on the subject; and, again, on his own initiative, he submitted to the members of the Peace Conference at the Hague a proposal for international regulations dealing with prisoners of war, consisting of 20 articles. M. Romberg Nisard's paper was a recapitulation of the work accomplished by his father, along with some suggestions of his own based on recent events. There was considerable discussion on this paper. One speaker strongly objected to any societies being organized to assist prisoners, because prisoners had no right to be prisoners, and because individuals likely to allow themselves to be captured would only be the more likely to do so if they knew that organized charitable societies would look after them. Further, Red Cross Societies would only bring themselves into discredit and under suspicion if they were organized to help prisoners of war. Another thought was that the funds subscribed to Red Cross Societies could not be diverted to any other purpose than aid to sick and wounded.

Medico=Military Index.

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Editorial Department.

NATIVE TROOPS FOR OUR COLONIAL POSSESSIONS

THE article on this subject was written in China several months before the outbreak of the Boxer Rebellion. That unexpected event afforded a rare opportunity for attesting the allegiance of the Chinese Battalion and fully vindicated the claims I have advanced for the employment of native troops when officered by Englishmen or Americans. Let it not be forgotten that Liu Kung Tao, Lau Chau, and the old city of Wei Hei Wei, where the Chinese Battalion was recruited, are located in the Shan Tung Province, which was the very hot-bed of the Boxer uprising. The following is an extract from my journal, of a conversation with Colonel Bower in Tien Tsin on the 9th of March, 1901. Colonel Bower was at that time the Imperial Commissioner representing Great Britain in the government in Tien Tsin. Replying to my question regarding the Battalion he said:

"No, there were practically no desertions from the Battalion although the men were subjected to terrible temptations. You know in China, parental love, Fung Shui, and ancestral worship are held as sacred tenets. When the Boxer movement was in its incipency the families, priests and friends of my men resorted to every persuasion and threat to induce them to desert but without success. Finally they organized an attack and placed the fathers of my men in their front ranks, so that, should the men shoot, they would become parricides—guilty of the most heinous crime known in the Orient. But in the fight that followed, they cut their way through the two thousand attacking Boxer rabble, killed many, and routed the remainder to the hills. Encouraged by this evidence of loyalty I took two of my three companies to Taku and joined General Seymour's column in its advance on Tien Tsin. In the fighting that followed from June 20th to July 14th the men did excellent work, losing in action twenty-six killed and fifty-six

wounded. One officer was killed and two severely wounded. Fearing trouble, I ordered roll call every hour after reaching Tien Tsin. Two men were supposed to have deserted, but later investigations showed that one had been taken prisoner and the other was killed. The most remarkable thing that happened was with the company left at Wei Hei Wei. These men were so chagrined and disappointed at being left behind, and so determined to participate in the fighting, that almost the entire command deserted, and fought their way through nearly fifty miles of hostile country to join their companions at Tien Tsin; where I kept them until active hostilities ceased. On returning to Wei Hei Wei, I shall renew recruiting and expect to largely increase the number of our Chinese force."

All the troops employed by Great Britain in the China Relief Expedition were Indian, most of them Gurkas, Sikhs, Beluchis, and Royal Bengal Lancers. Colonel Shone who has long been an officer of the Royal Engineers in the Imperial Army of India said to me:

"It would be quite impossible to maintain order in India without the employment of natives who can endure conditions in the tropics which would soon annihilate white troops. England has found it advisable to keep an army of 75,000 British troops; with 150,000 natives for her protection there. Too many of one tribe should not be employed in one locality; at least one-third should be white troops. Had this precaution been observed there never would have been a Sepoy rebellion or an Indian mutiny."

In the report of Adjutant General Corbin, published to-day, it is asserted, that if it is decided that General Chaffee's force shall not be reduced, 20,000 new recruits will be necessary to replace those leaving the Philippines through expiration of time of service, between now and July, 1902. As re-enlistments in the American Army are now comparatively rare, owing to the abolition of the Canteen and the hardships of tropical service, this force must practically be drawn from new blood, recruits, none of whom have been acclimated to tropical conditions. As the figures given in the Adjutant General's report show that in the Philippines about five men die from disease for one who falls in battle, and that the cas-

ualties there have already amounted to 3493, to say nothing of the enormous number invalided home to swell the pension rolls, it remains to be seen how much longer the American people will submit to this unnecessary waste of our home material when native force can be equally well substituted.

New York, Oct. 18, 1901.

LOUIS L. SEAMAN.

MEDICO MILITARY NOTES.

THE ARMY HOSPITAL CORPS AND THE PRESIDENT.—The Hospital Corps detachment on duty at the exhibit of the Army Medical Department at the Pan American Exhibition furnished all the male nurses connected with the case of the late President at Buffalo.

THE AMERICAN PUBLIC HEALTH ASSOCIATION AND THE POST EXCHANGE.—Resolutions favoring the restoration of the canteen feature of the Post Exchange were passed with but a single dissenting vote by the American Public Health Association at its recent session in Buffalo.

THE ARMY MEDICAL DEPARTMENT EXHIBIT AT THE PAN AMERICAN EXPOSITION.—The military medical exhibit under the direction of Captain Edward L. Munson of the army has proven to be one of the most popular features of the Pan American Exposition, as many as two thousand persons having witnessed the drills and viewed the exhibits in a single day.

THE UNITED STATES ARMY MEDICAL FIELD EQUIPMENT ABROAD.—Canada has officially adopted the new United States Army ambulance and the Munson ventilated hospital tent. The regulation litter has been officially adopted by the Mexican Army. Samples of the ambulance have been ordered by England, France, Spain, Chile, and Mexico. The Medical Department of the British Army has recently purchased complete sample sets of the United States Army medical, surgical, sterilizing, and detached service chests, folding field furniture, bath tubs, and brigade hospital mess chest on the recommendation of the British military attaché in Washington, who considered them superior to their own equipment.

In Memoriam.

President William McKinley, Commander-in-Chief of the Army and Navy of the United States of America.

Born in Niles, Ohio, January 29, 1843.

Died in Buffalo, N. Y., September 14, 1901.

VICTIM of the treacherous blow of an assassin, William McKinley, twenty-fifth President and Commander-in-Chief of the military and naval forces of the United States of America has passed away in the fulness of his powers, in the heyday of his achievements and in the plenitude of a people's love and affection. Assuming the chief magistracy at a critical period in the Nation's history, he guided the affairs of state so wisely and so skillfully that the republic emerged from a great international conflict, not only victorious in a war undertaken from the purest of motives, but with a newly confirmed national unity and a fixed position among the great powers of the world. Broad in mind, discriminating in observation and sympathetic in character, his temperament ever maintained an appreciative attitude toward the healing art both in peace and in war. He held his own physician by the closest ties of friendship and regarded the entire profession with generous and kindly interest. A soldier while hardly more than a boy, he knew, as do few, the difficulties, hardships and discouragements of the military surgeon. His generous qualities were never suppressed nor superseded. With intellectual attainments of the highest order, he possessed a masterly grasp of practical affairs, constituting a combination as rare as it was admirable. In his untimely decease the Country has suffered not only an irreparable national bereavement, but a distinct loss in personal character, although it has gained a splendid memory which will ever gild with the glow of kindness, intelligence, energy and strength the period of national existence moulded by his hand.

Reviews of Books.

MILITARY HYGIENE.*

THE Military Service is to be felicitated upon the production of so comprehensive and exact a work as Captain Munson's *Theory and Practice of Military Hygiene*. Hammond's compilation for the medical officers of the war of the Rebellion, Woodhull's manual for the instruction of the student officers of the Fort Leavenworth Infantry and Cavalry School, and the masterly chapters of Smart in Ziemssen's *Cyclopedia* and in the *Reference Handbook of Medical Science*, together with the various monographs pertaining to the subject in the *Proceedings of the Association of Military Surgeons of the United States*, have hitherto practically comprised the American literature of military hygiene. And the work of Parkes, an officer of the British medical service, has for a third of a century been the ultimate authority in the United States army, the various revisions by the author and by other authorities having easily maintained it in the lead in the contest for scientific precedence. It is interesting to learn that the United States is now reciprocating in this respect, Munson's work having been adopted as the official standard by the British army in India and supplied in large numbers to the English forces at home and in South Africa.

Taking the soldier at the beginning of his military existence, Captain Munson thoroughly canvasses the selection and development of the recruit. Personal hygiene is minutely considered in chapters on the soldier's cleanliness, food, clothing, habits, marching, and diseases, very appropriately concluding

**The Theory and Practice of Military Hygiene*. By EDWARD L. MUNSON, A.M., M.D., Captain, Medical Department, U. S. Army. Imp. 8vo, pp xii, 971. New York, William Wood & Co. 1901.

with an authoritative series of observations on the disposal of his remains.

Temporary collection in camps and troopships and permanent massing in barracks, quarters and hospitals receive conspicuous attention,—ventilation, heating, lighting, disinfection, and disposal of waste being appropriately considered in connection with each. Climatic conditions are discussed with ample references to the extremes of heat and cold, and the work concludes with a most suggestive and instructive chapter on military sanitary inspection, a feature of the work of the military surgeon which too often fails to receive the proper attention on the part of the medical officer and even more rarely meets with proper recognition on the part of him of the line.

In connection with the examination of the recruits the most recently accepted methods are described in such detail as to supersede the necessity for a special manual upon the subject, particular prominence being given to the work of Greenleaf. Of exceptional value is the discussion on military physical training found in the chapter on the development of the recruit, although the title may convey the impression that physical training should be confined to the recruit, whereas it should of course be continued until age has produced such degenerations as may render exertion dangerous. The writer is pleased to see that Captain Munson has adopted his translation of Hohenlohe's description of the German recruits before development by systematic exercise, and his division of physical training into two classes. Careful distinction is made between physical culture and competitive athletics, and the danger of overtraining is strongly emphasized. Equitation, natation and applied gymnastics are fully and clearly discussed, and the mental and moral hygiene of the soldier is not forgotten.

The discussion of the march in campaign is especially timely and up to date. Attention is called to the artificial nature of our step of 30 inches and the greater propriety of the German step of 31.2 inches, and the care of the feet is properly emphasized.

The chapter on water is particularly satisfactory and essentially practical. Microscopical and bacteriological examination is fully considered and the subject of purification is amply presented. The Forbes water sterilizer is described in detail and various extemporized procedures are illustrated, while the Maignen and Berkefeld apparatus receive ample attention.

The 137 pages devoted to the ration form a complete exposition of the subject of food from the soldier's standpoint, such as would be expected from the successful competitor for the Seaman prize for the best essay on "the ideal ration for an army in the tropics."* The author concludes that "the United States army ration is somewhat more than sufficient to meet all the demands of active muscular labor in a temperate climate", that it "is in excess of the physiological needs of the soldier in tropical service, but, on the other hand, it is undoubtedly insufficient for service in the far north", and remarks that, "bearing in mind that in tropical countries carbohydrates form the staple, while a mixed dietary is used in temperate climates, and fuel-foods, or fats, are required under cold temperatures,—the diet of troops should be suitably modified in these respects according to their geographical distribution." He recommends variety in cooking as a means of avoiding sameness in diet, and very properly steers clear of the post exchange discussion. He illustrates the Buzzacott cooking outfit for field use, but does not mention the "Dutch oven", so dear to the old campaigner, of which the Buzzacott is an evolution. His discussion of the individual articles of diet is encyclopedic, while the section on emergency or reserve rations is of especial value at the present time.

In the chapter on clothing and equipment, the present blanket-bag is condemned as "the most vicious article of the equipment of the United States soldier," an opinion which will be heartily endorsed by every experienced officer. He suggests the Merriam pack, the valise of the British foot serv-

*See Proceedings of the Association of Military Surgeons of the United States, vol. ix, p 298.

ice or the Novior knapsack as a substitute. He does not consider well-founded the objections to the use of aluminum in the construction of the soldier's mess outfit.

It is difficult to resist the temptation to override the limitations of space and consider in detail the instructive, scholarly and practical chapters on "Camp sites and Camps," "Posts, Barracks and Quarters," "Ventilation" and "Disinfection," "Heating and Lighting," "Military Mortality and Morbidity" and other subjects; it would be difficult to do them justice in any case.

The chapters, however, on the "Personal cleanliness of the Soldier" and the "Habits of the Soldier," demand especial mention, because of their broad teachings and logical method, while the absolutely modern attitude of the author toward the "Diseases of the Soldier" renders his chapter on that subject of genuine value to the reader.

The work forms a large book, and it is fortunate that the author did not yield to the tendency to separation and make two volumes of it. The multiplication of articles is a serious bar to usefulness, especially in the confusion inherent in field service. And large as the book is, not a word could well be omitted, and it thoroughly deserves the recognition it has received not only in the medical departments of our own and foreign armies, but also by officers of the line and other staff corps for the use of whom a large edition has been distributed by the Secretary of War to posts, transports and regimental headquarters. All departments are to be congratulated upon the possession of so practical an aid to the sanitary administration of the service.

JAMES EVELYN PILCHER.

A CIVILIAN WAR HOSPITAL.*

THIS BOOK, based upon the workings of an auxiliary tent hospital attached to the British forces in South Africa, though supported by private subscriptions and operated by civilians, is clearly written and attractively

**A Civilian War Hospital. By the Professional Staff, ANTHONY A. BOWLEY, HOWARD H. TOOTH, AND OTHERS.* 8 vo. pp. 8-327. New York, Longmans, Green & Co., 1901.

got up. The subject matter deals with the organization and equipment of such a hospital of 160 beds capacity and contains, also, the conclusions reached by the attending staff relative to the camp diseases and gunshot wounds with which their service in the field brought them in professional contact.

Beginning with the chapter on equipment of the hospital, the reader is forcibly impressed with the fact that in the matter of equipment for field hospitals, the Medical Department of the United States Army, as at present outfitted for the field, has nothing whatever to learn from the British Medical Service, on the lines of which this hospital was organized. The weight of this hospital for 160 patients amounted to no less than 70 tons, where the U.S. Army hospital of 100 beds weighs not more than one-seventh as much—the latter being transported in half a dozen army wagons while the field hospital in question needed a railroad train of some fourteen cars to move it. If similar conditions prevailed throughout the British Army, its inability to leave the railroad, wage an aggressive warfare or cope with a mobile enemy is readily explained. The cots used in this hospital weighed 60 pounds each, while those used in our own field hospitals weigh but 17 pounds each. Glass and china table ware were also carried with this hospital, and there are many other evidences of the retention of heavy, cumbrous and fragile articles of a character long since discarded in our own service. The ambulances pictured and described as used with this hospital appear more like heavy wains than the light, capacious and substantial vehicles used for the transportation of wounded in our own service. The deficiencies of the British ambulance are however fully admitted by the writers, who say: "We do not know of any good ambulance wagons that are purchasable in this country, and those that we took out ourselves left much to be desired." It may here be remarked parenthetically that the British Government has recently purchased a number of U. S. army ambulances for use in South Africa, and has also ordered samples of our entire field hospital equipment for trial.

The chapters on the diseases encountered of course deal chiefly with typhoid fever and dysentery, but they are not sufficiently full to be of the greatest scientific or practical value. The outbreaks of typhoid fever described are almost identical in their origination, course and severity with those prevailing in our own camps in 1898. Dr. Tooth, who writes up the medical side of the service, gives the first place in importance to typhoid fever, "without which scourge it must be remembered that the medical casualties of the campaign would have been comparatively insignificant." He regards the dissemination of typhoid infection among troops as due to bad water, infected flies and dust and to personal contact with the sick. He disproves his own first point, however, by showing that there was a higher rate of typhoid among the officers, who usually took care to drink only boiled water, than among the men, who would not be restrained from using doubtful sources of supply. Further, at Bloemfontein, as was the case with our own troops at Jacksonville and Lexington in the camps of 1898, typhoid raged among the British soldiers while it was no more severe than usual among the civilians of the adjoining town. The great importance of flies as carriers of infection was noted, and a curious preference on the part of flies to congregate around typhoid cases rather than other sick in the same ward is commented upon. Epidemics of typhoid were seen to cease abruptly with frost and the death of the flies, which, as the inhabitants of Bloemfontein said, "came with the army". As the fly plague largely depends upon the presence of filth, it is probable that no very efficient sanitary police existed in the camps. In speaking of the Modder River campaign, Dr. Tooth says: "It would appear in the present state of knowledge to be almost impossible to combat hygienically the spread of enteric fever in any army under similar conditions." This was, however, accomplished in our own army in several instances in 1898, as at Camp Meade. Dr. Tooth justly remarks: "It is quite unjustifiable to allow any man to return to duty which involves camp life after an attack of enteric fever, however slight, except after

a long interval, the extent of which has yet to be determined." Undoubtedly much typhoid fever was spread among our own troops in 1898 by the return to duty of convalescents who still harbored the germs of disease in their alimentary or urinary tracts. The authors are much impressed with the value of anti-typhoid inoculations, which their statistics go to show not only reduced the incidence of the disease but also diminished its severity when once contracted. It is thought that the amount of reaction following inoculation is a reliable indication of individual susceptibility, and repeated reinoculation is favored until no reaction is obtained. Many cases of fulminant typhoid were seen, and where such cases recovered, convalescence was unusually protracted. A rapid pulse gave an unfavorable prognosis, and diarrhoea was also regarded as an unfavorable symptom and treated where there were more than three movements daily. Many more cases died in which diarrhoeal symptoms were prominent than did those in which there was a tendency to constipation. The mortality among the typhoid cases treated amounted to 12.5 per cent.

The chapters treating of gunshot injuries are very interesting and contain much valuable information. They contain a short discussion on the subject of ballistics, projectiles and their effects, and are very fully illustrated with excellent radiographs. The X rays were apparently used as a matter of routine on all cases of gunshot injuries involving bone, and the authors are very enthusiastic as to their value in military surgery. They dispose summarily of the popular charge that the Boers used poisoned bullets, but at the same time show that the latter at times used "dum-dum" or mushrooming bullets, and illustrate the mangling effects produced by the latter. Like nearly all military surgeons with actual experience on the battle field, they are very skeptical as to the hard and fast rules of "explosive action" attributed to the full mantled bullet, within certain ranges, by experimental investigators. On page 117 they say: "It may be said in general terms that the actual experience of gunshot fractures in war does not confirm the very definite conclusions arrived at as a result of

experiment in times of peace, so that although much has been learned, it was soon evident that there was yet a good deal more to learn on this subject and that there had been a tendency to be too dogmatic as to the effect of high velocity projectiles." Again they say on page 180: "There are many factors to consider in determining the nature of a gunshot fracture, and no mere consideration of the bullet or the range is sufficient for a proper appreciation of the results observed." They place the chief factors in determining the character of gunshot wounds, in order of importance, as follows: (1) range, (2) character of bone, (3) angle at which the bone was struck. As a result of their experience, the authors conclude that bone injuries are liable to present the appearance of "explosive action" at any range, while wounds of tissue not involving bone rarely show any "explosive action," even at the shortest range. "We do not think that the range, or what is the same, the velocity, has any appreciable effect when soft parts alone are wounded. * * * When, on the other hand, bone is struck, and a good resistance is offered to the onward passage of the projectile, the velocity becomes an important factor, and the higher the velocity the greater is the damage and splintering done to the bone" (page 164).

Wounds with lodged bullets appeared to heal as kindly as if the missile had passed out. The good results obtained with bullet wounds were believed by them to be due (1) to the small wound produced by the Mauser, (2) favorable climatic conditions and (3) early antiseptic dressing. These views differ from those of our own army surgeons, who regard the antiseptic dressing as of by far the greatest importance. With regard to the enlargement of wounds for the removal of bone fragments, the authors believe that the character of the external wound furnishes a safe guide. If the wound opening is large, the bone fragments should be removed, but if the external wound is small, such removal is not usually required. Fragments of bone attached to the shaft should not be removed, as experience shows that these do not ordinarily necrose. The authors never performed or advised amputation

for an uncomplicated bullet wound, and state that the assumption of this position never subsequently caused regret. Joint injuries caused no trouble aside from that due to bone comminution, and these injuries were habitually treated like simple flesh wounds. Excision of joints is regarded by them as an operation of the past and as no longer indicated. There seemed to be no increased danger from haemorrhage in Mauser wounds, and they state that death on the battlefield from haemorrhage from wounds of the limbs rarely occurred in South Africa. Traumatic aneurism, however, gave rise to much difficulty, and ligation was followed unexpectedly often by gangrene. With regard to wounds of the skull, the authors say on page 220: "It may be stated here that the expected disruptive effects of the perfect Mauser bullet have not been seen. * * * In cases of bullet wound of the skull at ranges observed in this war, practical experience has not borne out the deductions of experiment." Wounds of the lung usually made good recoveries, but such cases do not bear rough handling and transportation without ill effects. Laparotomy has saved but few soldiers and must be regarded as among the unsuccessful operations in field surgery. The point is emphasized however, that wounds affecting the peritoneal cavity do not necessarily imply perforation of the intestine, and that a number of cases of supposed injury of the intestines which recover without operation very probably belong to this class. A number of cases are given to illustrate this point. Wounds of the large intestine are much more liable to recover without operation than are wounds of the small intestine. While the general opinion of military surgeons in South Africa was to the effect that 20 per cent of wounds of the intestine recovered without operation the authors were inclined to regard this estimate as too high, and call attention to the fact that injuries of the intestine should be studied as to their fatality rather on the firing line than in the hospital.

On the whole, there is much to commend in this book, which, though apparently written for the lay as well as the professional reader and neither suited nor intended to serve

as a text book, nevertheless contains much valuable information and is well worthy of careful perusal by the military surgeon. The large number of unusually good photographs and radiographs in the book add much to its value and attractiveness.

EDWARD L. MUNSON.

THE BRITISH ARMY MEDICAL SERVICE, 1899.*

THE interesting record of the work of the Medical Department of the British Army for 1899, is of the highest value to the military surgeon, covering statistics of service in all quarters of the globe, with special reports upon the health of the troops serving under all climatic conditions. In addition to the report proper, fourteen professional appendixes are presented, bringing the work down to a more recent date than appears in the title. Major Horrocks of the Army Medical School at Netley contributes a comprehensive report on the progress of hygiene for the year 1900; Majors Dick and Birt of the same institution present a report on the operative work, and Colonel McLeod reports upon the medical service of the Royal Victoria Hospital at Netley; most valuable reports are made by Major Macpherson on the international congress of "œuvres d'assistance en temps de guerre" of 1900, on the organization and resources of voluntary aid in France, and on the Russian army medical service exhibits at the Paris Exposition; an opportunity to "see ourselves as others see us" is afforded by the complete and appreciative reports of Colonel McWatters on the eighth and ninth annual meetings of the Association of Military Surgeons of the United States; in addition to the proceedings of the meetings proper, Colonel McWatters presents a full description of the "Oliver Collecting Stretcher" suggested by the "Pettee Emergency Carrier" shown at Kansas City, but not mentioned in the Proceedings; he also illustrates the Mahan carrier described by Medical Inspector Gravatt but not illustrated in the Proceedings.

JAMES EVELYN PILCHER.

**Army Medical Department Report for the year 1899*, with Appendix. Vol. 61, 8vo, pp. 517. London, 1901.

THE MILITARY BOARDS OF HEALTH AND OF
CHARITIES IN PORTO RICO.*

THE conquest of the Spanish dependencies by the United States military forces involved much more than the mere transfer of the reins of government from one nation to another. It was rather an entire transformation in the conduct of life. The conquest of Britain by the Normans was mild in its modifications of the habits and customs of the subject people as compared with the sanitary changes consequent upon the American occupation of our new dependencies. The rehabilitation of Porto Rico by the health board established and maintained under the military government is a conspicuous instance of the varied duties which fell to the care of the military surgeons upon the assumption of American sovereignty over Spanish colonies. The Superior Board of Health, established upon the recommendation of the chief surgeon of the forces of occupation, Lieut. Col. John Van R. Hoff, U. S. Army, consisted of that officer as President, Surgeon Arthur H. Glennan, U.S.M.H.S., Surgeon F. W. F. Wieber, U.S.N., Major George G. Groff, U.S.V., Dr. Gabriel Ferrer and Dr. Ricardo Hernandez, the last two gentlemen being local physicians of recognized professional acquirements. This body set to work systematically to establish a system of sanitation which should reduce the sick rate and mortality of the island. The many problems which presented themselves were promptly solved as they arose. The stupendous task of vaccinating the entire population with lymph from its own vaccine station was undertaken and successfully accomplished, and measures provided for the continued immunization of the people, as will be shown by a special report on the subject to be published in the next number of this Journal. It licensed the entire medical personnel of the island, and placed itself in touch with those upon whom it must depend in case of an epidemic. It organized a local board of health in every municipality and provid-

*Epitome of Reports of: I. The Superior Board of Health, II. The Board of Charities of Porto Rico, under the Military Government. Appendices to the Report of the Military Governor. By Major John Van R. Hoff, President of both Boards. 8 vo; pp. 359; Washington, Government Printing Office, 1901.

ed regulations for the government of such bodies. It established a hygienic laboratory and promulgated stringent regulations relative to the purity and wholesomeness of foods and medicines, requiring the formulas of all proprietary and patent medicines to be registered in the office of the board. It prepared and promulgated an important series of sanitary regulations, published in thirteen circulars and covering the subjects of pure foods, the practice of medicine and pharmacy, nuisances, interior quarantine, the control of cemeteries, vital statistics, contagious diseases of animals, etc., all of which are presented in full in this report. In fact, no phase of the erection of a healthful situation upon the wreck of an effete and disease-ridden administration was neglected, and the work of this board forms the most brilliant chapter in the splendid history of the American rejuvenescence of a degenerated people.

Another function, neither medical nor military, but especially allied to the former has fallen to the lot of officers of the medical department. The work of Colonel Hoff, as President of the Board of Charities in Porto Rico and of Colonel Kean as Superintendent of the Department of Charities in Cuba will live as distinguished examples of the adaptation of the military surgeon to genuine altruism. The work in Porto Rico, inaugurated upon the recommendation of Colonel Hoff, was administered by an officially detailed Board of Charities consisting of himself as president, and Surgeon Wieber of the Navy, Captains Wells and Reynold and Contract Surgeon Cowper of the Army, Dr. del Valles, Father Nin and Chaplain Brown. The immediate cause of the formation of this board was the great destitution consequent upon the hurricane of August 8, 1899. The board was tireless in its work. It received and distributed over thirty-two million pounds of food, and many thousand garments. Its administration of this distribution was so wisely managed that in return for the food and clothing donated it secured the clearing and return to cultivation of all the coffee plantations in Porto Rico; it built or repaired numerous trails leading in every direction through

the mountainous regions of the island; it cleaned the towns, rebuilt hundreds of houses and was limited in its work of reconstruction only by the lack of implements to put into the hands of tens of thousands of persons who were glad to contribute freely of the labor of their hands in return for the aid rendered to them. The amount of means at the disposal of the board was infinitely below the needs of the emergency, but the freely tendered services of American officers and the singular judgement with which it was administered renders the solution of this problem uniquely successful. To the execution of another important function, the board brought the same intelligent interest and energy,—the supervision of the insular charitable institutions. It enlarged the accommodations for orphan children and reorganized and improved its management. It expanded, developed and modernized the insane asylum, placing it upon a scientific and business foundation. It planned the organization of a leper colony at Punta Salinas, and urged the complete isolation there of all Porto Rican victims of the disease, meantime caring for a number already but inadequately housed at Puerta de Tierra. It proposed the establishment of a house of correction for youthful incorrigibles, and met a host of emergencies which constantly arose in the management of the varied interests which came under its supervision. The picture of the deeds of this body ought to be laid before every citizen of the republic, as an object lesson in civic administration and an example of the unpaid labors of those men upon whom a country is all too apt to look with unappreciative and ungrateful eye.

JAMES EVELYN PILCHER.

WEBSTER'S INTERNATIONAL DICTIONARY.*

IN its successive editions, the original dictionary of Noah Webster, has continuously adapted itself to the times and to the state of development of a tongue which is so essentially living that hardly a day passes without the birth of

**Webster's International Dictionary*, with a Supplement of twenty-five thousand words and phrases. W. T. Harris, LL.D., Editor-in-chief. 4 to., pp. 2364, Springfield, Mass., G. & C. Merriam Co., 1901. ✱

a word. Recent investigations as to the number of words used in conversation by various classes of individuals have shown that the old fables as to the limited vocabulary of colloquial man were quite unfounded. An authoritative work like Webster, in a single volume, and readily consulted is a necessity of the times. It is a vade mecum, with which the scholar can not dispense, be he ever so rich in professional or technical dictionaries. The military portion in the present edition has been supplied by Professor Fiebiger of West Point, while the medical additions have been made by Lieut. Col. Billings, of the retired list of the army. The new words and new definitions are many and unexceptionable. A glance through the supplement reveals such additions as "Aden ulcer," "agar agar," "ainhum," "autopathic," "appendicectomy" and "appendectomy," "Boxer," "cyesis," "desmosis," "electrovection," "ethmoiditis," "fungate," "gliosis" and "gliomatous," "haematokrit," "hike," "hypnogenesis," "jugulation," "Koch's lymph," "kopje," "laryngectomy," "meningococcus," "myeloma," "necrotomy," "nicotism," "orders" of knighthood, nobility and merit, "paralgesia," "periostosis," "polyneuritis," "risus sardonicus," "sapphism," and "thanatophobia." "Ordnance department" of the army, and "signal corps" are fully defined but we fail to find "medical department" and "hospital corps," which should with equal reason be added. We do not find the phrase "first aid," which has attained so wide an acceptance and so distinctive a meaning as to entitle it to consideration in another supplement.

JAMES EVELYN PILCHER.

THE ARMY MEDICAL DEPARTMENT IN 1900-1901.

THE REPORT of the Surgeon General of the United States Army for the fiscal year 1900-1901 is of particular interest as being the last report of the scholarly, energetic and progressive officer, whose retirement next June will be the source of genuine regret upon the part of the entire service and no less upon the part of this Association to the development of which he has so materially contributed.

THE REPORT OF THE SURGEON GENERAL OF THE ARMY FOR THE FISCAL YEAR ENDED JUNE 30, 1901.

In submitting a report of the administration of the duties of this office during the past year, I have the honor, first, to invite attention to the financial transactions for the year ended June 30, 1901:

FINANCIAL STATEMENT, 1901.*

Medical and Hospital Department, 1901.

Appropriated by act approved May 26, 1900.....	\$2,000,000.00	
Transferred from appropriation "Medical and hospital department, 1899," by act approved March 3, 1901.....	150,000.00	\$2,150,000.00
Sale to Quartermaster's Department.....	70.00	
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations \$45,957.94).....	46,234.20	46,304.20
Total to be accounted for.....		<u>\$2,196,304.20</u>
Disbursed during the year:		
Expenses of medical supply depots.....	563.32	
Medical supplies.....	1,519,717.50	
Medical attendance and medicines.....	12,088.26	
Medical expenses of recruiting.....	37,825.95	
Pay of nurses.....	83,245.09	
Pay of other employees.....	141,963.87	
Washing of hospital linen.....	57,775.28	
Miscellaneous (notary fees, exchange and expressage).....	90.48	
		<u>1,853,269.75</u>

*. The disbursements in this statement include settlements with public creditors made by the accounting officers of the Treasury and charged by them to these appropriations;

Transferred by Treasury settlement to adjust appropriations.....		2.67
Balances on hand June 30, 1901:		
In United States Treasury and in transit thereto	200,340.00	
In hands of disbursing officers:		
Washington.....	8,514.06	
St. Louis.....	19,642.45	
San Francisco.....	34,472.85	
St. Michael, Alaska.....	3,521.35	
Havana, Cuba.....	458.89	
Tientsin, China (Peking relief expedition)	2,817.25	
Nagasaki, Japan (Peking relief expedition)...	4,631.97	
Manila, P. I.....	68,093.10	
Aparri, P. I.....	294.74	
Iloilo, P. I.....	240.56	
Vigan, P. I.....	4.56	343,031.78
Total accounted for.....		2,196,304.20
<i>Medical and Hospital Department, 1900.</i>		
Balances on hand July 1, 1900*, acts of March 3, 1899 and February 9, 1900.....		\$445,463.89
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations \$526.62).....		2,646.40
Total to be accounted for.....		448,110.29
Disbursed during the year:†		
Expenses of medical supply depots.....	\$ 100.94	
Medical supplies.....	142,908.00	
Medical attendance and medicines.....	2,898.25	
Medical expenses of recruiting.....	2,821.65	
Pay of nurses.....	9,506.76	
Pay of other employees.....	3,769.19	
Washing of hospital linen.....	8,232.52	
Miscellaneous (notary fees and exchange)	286.42	170,523.73
Transferred by Treasury settlements to adjust appropriations.....		167,364.28
Balances on hand June 30, 1901:		
In United States Treasury.....	105,403.81	
In hands of disbursing officers:		
Washington.....	4,117.82	
San Francisco.....	700.65	110,222.28
Total accounted for.....		448,110.29

* Including balance at Cebu, P. I., June 1, 1900, the June account from that station not having been received at date of last annual report.

†Including disbursements at Cebu, P. I., during June, 1900, not previously reported. See preceding note.

Medical and Hospital Department, 1899.

Balances on hand July 1, 1900, acts of March 15, 1898, January 5, 1899 and March 3, 1899.....	385,081.70	
Refunded during the year (including transfer settle- ments by Treasury Department to adjust appro- priations \$123,015.23)	\$123,079.64	
Erroneous deposit on account of board of officer in hospital.....	24.00	123,103.64
Total to be accounted for		<u>506,185.34</u>

Disbursed during the year:

Medical supplies.....	1,677.87	
Medical attendance and medicines.....	3,764.83	
Medical expenses of recruiting.....	114.60	
Pay of nurses.....	1,544.51	
Pay of other employees,.....	224.13	
Washing of hospital linen.....	297.30	
Exchange.....	519.39	8,142.63
Treasury settlement to cancel erroneous deposit on ac- count of board of officer in hospital.....		24.00
Transferred to appropriation "Medical and hospital de- partment, 1901" by act approved March 3, 1901,.....	150,000.00	
Transfer to surplus fund.....		<u>350,018.71</u>
Total accounted for		<u>508,185.34</u>

Medical and Hospital Department, January 1, 1899.

Balances on hand July 1, 1900, acts of May 4, 1898, June 8, 1898, and July 7, 1898.....	\$26,521.24	
Refunded during the year.....	10.29	
Total to be accounted for.....		<u>26,531.53</u>

Disbursed during the year

Medical supplies.....	\$ 952.45	
Medical attendance.....	341.29	
Medical expenses of recruiting.....	32.40	
Pay of nurses.....	3.25	
		\$ 1,329.39
Transferred to surplus fund.....		<u>25,202.14</u>
Total accounted for.....		<u>26,531.53</u>

Medical and Hospital Department, Certified Claims.

Appropriated by act approved March 3, 1901	\$ 8.50
Disbursed during the year	8.50

Appropriation for National Defense, Act of March 9, 1898.

Allotment by the President April 16, 1898:

Balance on hand July 1, 1900	\$5.51
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	5.51

Reallotment by the President September 8, 1898:

Balance on hand July 1, 1900	\$ 1,592.59
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	1,592.59

Allotment by the President October 6, 1898:

Balance on hand July 1, 1900	\$24,124.63
Refunded during the year	99.85

Total to be accounted for

24,224.48

Disbursed during the year:

Medical attendance	\$ 213.15
Medical expenses of recruiting	88.40
	\$ 301.55

Amount not drawn from Treasury, no longer available, dropped
to close account on books of this office

23,922.93

Total accounted for

24,224.48

Allotment by the President November 22, 1898:

Balances on hand July 1, 1900	\$21,481.68
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Disbursed during the year:

Medical supplies	\$ 12.50
Medical attendance	528.00
Medical expenses of recruiting	421.40
Washing of hospital linen	12.50
	\$974.40

Amount not drawn from Treasury, no longer available,
dropped to close account on books of this office

20,507.28

Total accounted for

\$21,481.68

Reimbursement to Contract Nurses, (Traveling Expenses.)

Appropriated by act approved June 6, 1900	\$4,000.00
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Disbursed during the year.....	677.44
Balance in United States Treasury June 30, 1901.....	3,322.56
Total accounted for.....	<u>\$4,000.00</u>
<i>Artificial Limbs, 1901.</i>	
Appropriated by act approved June 6, 1900.....	\$173,000.00
Disbursed during the year.....	156,814.61
Balance on hand June 30, 1901.....	<u>\$16,185.39</u>
<i>Artificial Limbs, 1900.</i>	
Balance July 1, 1900, act of March 3, 1899.....	\$43,302.05
Disbursed during the year.....	6,968.05
Balance on hand June 30, 1901.....	<u>36,334.00</u>
<i>Artificial Limbs, 1899.</i>	
Balance July 1, 1900, act of July 1, 1898.....	0.00
Refunded during the year.....	50.00
Total to be accounted for.....	<u>50.00</u>
Disbursed during the year.....	\$ 45.32
Balance on hand June 30, 1901.....	4.68
Total accounted for.....	<u>50.00</u>
<i>Artificial Limbs, Certified Claims.</i>	
Appropriated by act approved March 3, 1901.....	\$960.21
Disbursed during the year.....	860.21
<i>Appliances for Disabled Soldiers, 1901.</i>	
Appropriated by act approved June 6, 1900.....	\$ 2,000.00
Disbursed during the year.....	1,454.52
Balance on hand June 30, 1901.....	<u>545.48</u>
<i>Appliances for Disabled Soldiers, 1900.</i>	
Balance July 1, 1900, act of March 3, 1899.....	979.50
Disbursed during the year.....	74.25
Balance on hand June 30, 1901.....	<u>905.25</u>
<i>Appliances for Disabled Soldiers, 1898.</i>	
Balance July 1, 1900, act of July 1, 1898.....	\$690.11
Transferred to surplus fund.....	<u>690.11</u>

Army Medical Museum, 1901.

Appropriated by act approved May 26, 1900	\$5,000.00
Disbursed during the year	2,889.70
Balance on hand June 30, 1901,	<u>2,110.30</u>

Army Medical Museum, 1900.

Balance July 1, 1900, act of March 3, 1898	\$2,113.43
Disbursed during the year	1,453.00
Balance on hand June 30, 1901	<u>660.43</u>

Army Medical Museum, 1899,

Balance July 1, 1900, act of March 15, 1898	\$14.80
Transferred to surplus fund	14.80

Library, Surgeon General's Office, 1901.

Appropriated by act approved May 26, 1900	\$10,000.00
Disbursed during the year	<u>6,675.87</u>

Balance on hand June 30, 1901	<u>3,324.13</u>
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Library Surgeon General's Office, 1900.

Balance July 1, 1900, act of March 3, 1899	1,224.63
Disbursed during the year	<u>1,213.42</u>

Balance on hand June 30, 1901	<u>11.21</u>
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Furnishing Trusses to Disabled Soldiers, (sections 1176, 1177 and 1178. Revised Statutes, and act of March 3, 1879.)

Expended during the year	\$7,807.44
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Artificial Limbs and their Commutation. Under the laws relating to artificial limbs there were furnished during the year ended June 30, 1901, 37 artificial legs, 2 arms and 2 feet, while commutation certificates were issued and paid in the cases of 151 amputated legs, 113 amputated arms, 9 amputated feet and 2,748 cases in which the loss of the use of a limb was regarded as proved by the evidence on file. These cases involved the expenditure of \$156,863.72 from the appropriations available. For the current year the sum of \$125,000 was appropriated which will probably suffice to meet the requirements of the survivors who were last paid in 1899.

During the year ending June 30, 1903, the cases which were paid in the fiscal year ended June 30, 1900 will again re-

quire to be met together with a series of new claimants resulting from disabilities incurred in the Spanish-American war and the Philippine insurrection. In the year ended June 30, 1900, the sum of \$506,595.24 was expended. It is believed that the number of deaths that have occurred among these beneficiaries will be more than offset by claimants for disability from the war forces of the country in service since 1898, together with the increasing disabilities of the survivors of the Civil war. A careful consideration of the conditions indicates that the estimate for the year ending June 30, 1903, should be at least \$514,000.

Appliances for disabled soldiers. During the past year the sum of \$1,528.77 was expended for 192 appliances issued to disabled soldiers.

Trusses. The number of trusses issued and fitted during the year was 1,054 at a cost of \$7,807.44.

Providence Hospital. The Act of Congress approved June 6, 1900, appropriated \$19,000, for the support and medical treatment of destitute patients in the City of Washington, D. C., under a contract to be made with the hospital by the Surgeon General of the Army. During the year 1,711 patients were afforded relief under this appropriation. The average number treated daily was 128 and the average number of days of treatment for each patient was 41.

Army and Navy General Hospital, Hot Springs, Arkansas. Twenty-seven officers were treated during the year, 21 of whom were returned to duty or to residence much benefitted by their treatment in the hospital. In the enlisted men's division 369 were under treatment during the year; 208 of these men were returned to duty, or if ex-volunteers, returned to their homes very much improved.

The Army General Hospital for the treatment of pulmonary tuberculosis at Fort Bayard, New Mexico. In October, 1899, Fort Bayard, New Mexico, was, on my recommendation, discontinued as a military post and its buildings were transferred to the Medical Department of the Army for conversion into a sanatorium or hospital for the treatment of cases of pulmonary

consumption. As the abandonment of the post had been in contemplation for some years the buildings were in poor condition and required many repairs and improvements to fit them for hospital use. These were speedily effected and the hospital is now in excellent condition. The selection of Fort Bayard as a site for a sanatorium has been amply justified by the results. Its location in the dry mountainous region of Southern New Mexico, at an altitude of 6,040 feet, affords a climate permitting comfortable outdoor life during the entire year. During the past fiscal year 344 patients were under treatment in this hospital. Of these 184 were discharged, 40 died and 120 remained under treatment June 30, 1901. Ten of the 40 deaths occurred in patients who had been in hospital less than a month. Of those discharged, 17 had been in hospital but a short time. The others were treated an average of 5.4 months and when they left the hospital 10 were clinically cured, 26 convalescent, 73 improved and 58 not improved.

Army Medical Museum. The total number of specimens in the Museum on June 30, 1901, was 34,988; 813 specimens were discarded or transferred and 381 added during the year.

Library of the Surgeon General's Office. On June 30, 1901, there were in the library 140,539 volumes, 4,644 having been added during the year. There were also 236,728 medical pamphlets and theses, 8,211 having been added during the year. Volume VI, second series of the Index Catalogue, includes the letters G and H to Hernette and forms a volume of 1,051 pages. It will be ready for distribution at the usual time. The appropriation for Volume VII, second series, having been made, the manuscript is in course of preparation for the printer.

Medical Officers, United States Army. The total number of regular medical officers allowed by law under the Army Reorganization Act (approved February 2, 1901) is 321; number in service June 30, 1901, 245; number of vacancies on that date 76. Fifty-seven *appointments* as first lieutenants and assistant surgeons were made during the year. *Promotions:* Five officers from lieutenant-colonel and deputy surgeon gen-

eral to colonel and assistant surgeon generals; 8 from major and surgeon to lieutenant-colonel and deputy surgeon general; 20 from captain and assistant surgeon to major and surgeon and 5 from first lieutenant and assistant surgeon to captain and assistant surgeon. *Retirements*: Three colonels and assistant surgeons general and 2 captains and assistant surgeons (retired with the rank of major.) *Deaths*: One colonel and assistant surgeon general, 2 majors and surgeons and 1 first lieutenant and assistant surgeon. *Resignation*: One first lieutenant and assistant surgeon.

The appointments were made on the recommendation of examining boards in session in San Juan, P. R., Manila, P. I., Washington, D. C., and San Francisco, Cal. It is gratifying to note that although the percentage of candidates approved by the boards recently in session is 24.84 as compared with 19.23 approved by the boards in session during the ten years 1889—1898 inclusive, there has been no lowering of the standard of admission. So many of the recent candidates were young men who had proved their capabilities physical and professional, by one or more years of active service as volunteer or contract surgeons that the ratio of successful candidates was necessarily higher among them than among the young medical graduates who came before the earlier boards. For instance, few of those who appeared before the board in session in Washington, D. C. had previous service and among them the ratio of approved candidates was only 16.67 per cent as compared with 19.23 per cent during the decade cited.

Medical Officers of Volunteers. All the medical officers of the Volunteers, staff and regimental, appointed under previous acts of Congress were mustered out of service June 30, 1901. Under the act approved February 2, 1901, there were appointed for service in the Division of the Philippines 50 surgeons with the rank of major and 150 assistant surgeons with the rank of captain. One major and surgeon and 2 first lieutenants and assistant surgeons died during the year.

Contract Surgeons, U. S. Army. There were in service June 30, 1900, 462 contract surgeons. During the year ended

June 30, 1901, contracts were made with 265 physicians; 333 contracts were annulled and 7 terminated by death, leaving in service June 30, 1901, 387 under contract. Of this number 106 were on duty in the United States, 17 on transports, 14 in Cuba and 250 in the Philippines.

Dental Surgeons. The corps of 30 contract dental surgeons authorized by the act approved February 2, 1901, is in progress of formation. On June 30, 1901, 14 dental surgeons who had passed the examining board were assigned, 1 to the Department of Cuba, 11 to the Division of the Philippines and 2 to posts in the United States.

Army Medical School. Existing conditions in the Army Medical Department rendered it impracticable to carry out the usual school program during the session of 1900-01.

Hospital Corps. On June 30, 1900, the Hospital Corps consisted of 167 hospital stewards, 381 acting hospital stewards and 3,543 privates, a total of 4,091 enlisted men. During the year ending June 30, 1901, the Corps gained by enlistment, reenlistment, transfer from the line, etc., a total of 1,082 men and lost 837, among the latter being 97 by discharge on surgeon's certificates of disability, 36 by death from disease, 2 killed in action, 3 by drowning and 3 by suicide, leaving in service June 30, 1901, 246 hospital stewards, 388 acting hospital stewards and 3,702 privates, a total of 4,336.

To replace the loss of hospital stewards that would be occasioned by the muster out of the volunteer regiments, Congress in its act approved February 2, 1901, allowed an additional 100 hospital stewards making a total of 300. Fifty of the new appointments were allotted to the Division of the Philippines. On the recommendation of the Chief Surgeon of that Division, 27 candidates who had passed the required examination were appointed up to June 31, 1901. To fill the remaining vacancies examinations were held in the United States, Cuba and Porto Rico and 30 successful candidates were appointed.

Owing to an increased demand for men of the Hospital Corps for duty in the Division of the Philippines and with the

China Relief Expedition, general recruiting officers and attending surgeons at important points were granted authority in July, 1900, to enlist desirable men for the Corps without reference to this office. The number required having been obtained this general authority was withdrawn in September, 1900, and thereafter enlistments were authorized only in cases where the candidates had previous service in the Army or were exceptionally desirable by reason of education, character and physique. In January, 1901, to meet the current requirements of the Corps recruiting was resumed. By the end of March sufficient men had been enlisted for this purpose when general recruiting was again suspended and remains so up to this time.

During the year special attention has been given to the instruction of the men of the Hospital Corps, it being realized that a considerable part of the success of the department depends upon this important organization. Of the nearly 5,000 men now constituting the Corps a very large part have entered the service since 1897 and but few of them, from the necessities of the situation, could receive the careful training given the sanitary soldier in our Army before the Spanish-American war.

Schools of instruction have been maintained at the Army General Hospital Washington Barracks, D. C., at Fort McDowell, Cal. (Angel Island) and at Hospital No. 3, Manila, P. I. Most valuable work has been done in these organizations which are now all running on a high plane of efficiency. Detachments of instruction were established at such posts as Fort Columbus, N. Y., Fort Sheridan, Ill., Fort Snelling, Minn., Fort Leavenworth, Kans., Fort Sam Houston, Texas, Fort Logan, Colo., and Vancouver Barracks, Wash.

I take pride in stating that the men of the Hospital Corps have borne themselves creditably under all conditions of service. Many have been specially commended during the past year.

Army Nurse Corps. With the passage of the Army Reorganization bill the Nurse Corps became part of the Medical

Department. During the past year the number of nurses was reduced from 210 to 175, 96 of these are in the Philippines and 43 are on duty in the General Hospital Presidio of San Francisco, Cal., the others scattered.

Medical and Hospital Supplies. The operations of the Supply Department fully described in my annual report for the year ending June 30, 1900, have been continued on the same lines during the past year. Medical and hospital supplies in abundance and of good quality including all modern apparatus and appliances necessary to the proper diagnosis and treatment of diseases and injuries have been promptly furnished for the use of hospitals, military posts and troops in the field. The three principal home depots at New York, St. Louis and San Francisco are conveniently located for the purchase, storage and distribution of supplies and continue to serve their purpose with economy and efficiency to the Department.

With the improved and rapidly improving conditions in our foreign possessions and the concentration and reduction of the military forces stationed there, the work of the Supply Department has been simplified and diminished. The necessity for rush orders and emergency action, unavoidable during hostile operations, is less frequent and more opportunity for deliberation and the exercise of economy is presented.

Since my last annual report a corps of contract dental surgeons has been attached to the Medical Department, which made it necessary to provide professional outfits of instruments and appliances required in their field and laboratory work and to arrange these supplies for packing in secure and convenient form for transportation and use under the conditions presented in the military service. This has been successfully accomplished and these equipments are now in the hands of dental surgeons at various stations from Porto Rico to the Philippines.

Medical Inspections. I would again respectfully renew my recommendation that the regulation which has for several years practically interdicted systematic inspections by chief

surgeons and which regulation is continued in force in par. 1671 A. R., 1901, be modified to read "Chief surgeons will visit each post in their departments at least once a year," etc. No argument in support of this would seem to be necessary. The work of the Medical Department is primarily with men and secondarily with material. The men are the invalids, who represent a considerable percentage of the line of the Army, whose condition and wants can be intelligently appreciated only by an educated physician, and the personnel, the sanitary soldiers, who care for them. In other services the necessity for such inspections is admitted and met by a corps of medical inspectors. Indeed this was the case in our service during the war of 1861—65. But since the promulgation of this regulation, which includes the period during and since the Spanish-American war, such medical inspections have been made irrespective instead of because of regulations.

Recruiting. The total number of men examined for enlistment in the Regular Army during the year 1900, was 39,916. The ratio of accepted men was considerably smaller than during the years immediately preceding. In 1897, a year of peace, the ratio was 702.19 out of every thousand examined. In 1898 during the active recruiting to increase the numerical strength of the army the accepted men numbered 770.47 per thousand examined but in 1899 the ratio decreased to 681.24 and during the past year to 563.16 showing evidently that greater care is exercised in the selection of men for the service.

Identification of deserters and other undesirable men. By the use of the outline figure card 351 men were identified in 1900 and 265 during the first half of 1901.

HEALTH OF THE ARMY. The health of the Army must be regarded as having been unusually good during the calendar year 1900; but to give a proper valuation to this statement the statistics of our Army from the time of the Civil war must be taken into consideration. For many years after that war the admissions to sick report, discharges for disability and deaths were somewhat similar to those reported during the past year but then they were the result of service in the gar-

risons of the United States while now they result from what practically has been war service in the Philippine Islands. Sanitary improvements in the condition of the soldier gradually lessened the rates year after year subsequent to the Civil war among the troops in the United States, until in 1894 the admission rate from all causes fell to 1089.73 per thousand of strength. The lowest admission rate for disease was 830.65 in the year 1896. The lowest death rate from all causes was 5.11 per thousand of strength, 3.14 having been the rate for disease, both of which were recorded in the year 1897, the year preceding the great change in the sanitary environment of the soldier which resulted from the outbreak of the Spanish-American war. Following that outbreak we had heavy rates of sickness and mortality due to the exposures of active service in Cuba, Porto Rico and the Philippine Islands. For a short time these rates were in excess of those of the Civil war when at their worst, but the sanitary knowledge of the present time put to energetic practical use speedily caused a cessation of these excessive war rates, leaving the ratios still as high as those which prevailed in the garrisons of the United States for a number of years after the close of the Civil war.

The increase in the ratios of admissions to sick report, discharges and deaths during the past year over those of the years 1894-1897, is due to the relatively large proportion of our military force which served under war conditions in the Philippine Islands and China; but for this, the rates given by the Army would have made a very satisfactory record as those given by troops serving in Cuba, Porto Rico and the United States were by no means heavy.

The admission rate for all causes in the Army; volunteers and regulars with a mean strength of 100,389 in 1900 was 2311.81 per thousand of strength as compared with 2178.06 in the previous year; but during the year 1899 only 39,280 men out of a total of 105,546 were serving in the Philippines while during the past year 66,882 of a total of 100,389 were thus serving. This is an important point to remember in considering the sick rates of the two years.

The troops serving in the United States during the year 1900 (mean strength 20,690) had an admission rate of 1510.97 per thousand of strength as compared with 1677.51 during the previous year. The death rate was 7.78 from all causes per thousand of strength as compared with 7.89 in the previous year; 4.83 from disease as compared with 6.56 and 2.95 from injury as compared with 1.33.

In the Philippine Islands with a mean strength of 66,882, the admission rate was 2621.96 as compared with 2395.52 in the previous year, this increase being mainly due to disease among the volunteers, the ratio for which rose from 1859.21 to 2761.79. The regulars on the other hand showed a marked decrease in the ratio of admission for disease which fell from 2454.10 to 2197.73. Two-thirds of the admissions for disease were caused by malarial fevers and diarrheal diseases. The deaths from all causes amounted to 28.75 per thousand of strength as compared with 30.58 in the previous year. Disease occasioned 20.26 deaths, the principal cause of the fatalities being dysentery, which with other intestinal diseases gave a rate of 9.08. The rate from injury amounted to 8.49.

The death rate in China was large, 47.76 per thousand of strength, 23.62 from disease and 24.14 from injury.

From the close of the calendar year 1900 to the latest reports, the health of the troops in the Philippines has been steadily improving. The Chief Surgeon has reported a progressive diminution in the nonefficiency of the command from disease and injury. In July and August, 1900, the nonefficiency constituted 9.47 and 9.58 per cent of the strength. From January to June, 1901, the nonefficiency was less than 7 per cent, the lowest rate 6.12 per cent. having been recorded in March. Intestinal and gastric diseases including dysentery and typhoid fever gave 34.22 per cent of the total sickness, malarial fevers 15.23 per cent and venereal diseases 13.10 per cent. Typhoid fever which scourged our camps in 1898, appeared only sporadically constituting merely 1.78 per cent of the total sickness. Most of the malarial cases were mild and made little or no figure in the mortality returns. Smallpox, so

prevalent and deadly in the early occupation of the islands has almost entirely been suppressed. Dysentery, constituting 13.44 per cent. of all cases of sickness, is the dangerous disease. Bubonic plague, although a subject of importance to the medical officers, members of the Board of Health of Manila and to those temporarily assigned for duty with the board as inspectors, on account of its prevalence among Chinese and Filipinos, appears to have given but little anxiety to medical officers serving with troops, as during the year only one case was reported as having occurred in the Army in the person of an enlisted Chinese cook of the 27th infantry at Camp Stotsenberg, near Manila.

The health of the troops serving in Cuba was excellent during the year. With a mean strength of 8,690 the admission rate was 1873.07 as compared with 2749.74 in 1899, the rate for disease having been 1586.19 as compared with 2537.98. The death rate from all causes was 9.78 as against 18.30 in 1899. But for the occurrence of yellow fever the death rate from disease in this command would have been only 4.72 per thousand of strength. One hundred and forty-four cases were reported of which 32 were fatal, giving a death rate of 3.68 per thousand of strength. Since the close of the calendar year the health of the troops has continued good. Under date of July 26, 1901, the Chief surgeon reported that since November, 1900, the only cases of yellow fever that had occurred in our military garrisons were the nine cases in the persons of men who were experimentally inoculated by infected mosquitoes at Quemados.

As a result of the American occupation of the Island, every city has its health officer and every inland town where troops are stationed has had its sanitary condition more or less improved by the energy of the post commander and medical officer, the latter acting as a sanitary inspector for the municipality.

The medical record of the troops in Porto Rico for the year 1900, is an excellent one, comparing favorably with that of the troops serving at the home stations. With a mean

strength of 2,180 for the year the admission rate for all causes of disability was 1577.98 as compared with 2522.40 during the previous year. The death rate was only 5.05 per thousand of strength as against 11.27 in 1899. All the deaths were the result of disease. It will be observed that this death rate is lower than the lowest recorded death rate in our Army, 5.11 per thousand in 1897, in the carefully supervised garrisons of the United States prior to the sanitary change made by the outbreak of the Spanish-American war.

PREVALENCE OF SPECIAL DISEASES. Cases of *scarlet fever*, *diphtheria* and *cerebro-spinal fever* were, as usual, rare among the troops. *Measles* and *mumps* were, on the other hand, of quite frequent occurrence. In the United States measles had an admission rate of 11.36, the mean annual rate for the previous decade having been 8.46 per thousand of strength. The infection of this disease was imported into the Philippine Islands on almost every transport. The admission rate for Volunteers in these islands was 8.18 per thousand of strength and for regulars 1.61. Similar rates prevailed as regards mumps.

Typhoid Fever. No epidemic of typhoid fever occurred among the troops during the year. In the army as a whole the admission rate was 9.74 per thousand of strength and the death rate 1.63, as compared with the mean annual rates, 5.19 and .56, for the ten years preceding the outbreak of the Spanish-American war. Among troops in the United States the admission rate was 5.56, the death rate .43 per thousand of strength. In addition to these there was quite a large admission rate for fevers of undetermined causation most of them probably typhoid fever of mild character as these cases had practically no death rate.

Yellow fever. During the calendar year 1900 there were 144 cases of this disease, 32 of which were fatal, reported from the Army, showing for the whole Army, regulars and volunteers with a strength of 100,389 men, an admission rate of 1.43 and a death rate of .32 per thousand of strength. During the decade 1889-98 the mean annual admission rate was 2.08 and the death rate .25 per thousand men.

Malarial fevers. The rates for malarial disease were heavy during the year, owing to the great prevalence of these diseases in the Philippines and Cuba. The admission rate for the whole army was 706.52 and the death rate 1.36 as compared with the mean annual rates of the decade 1889-98, 174.29 and .58. The rates for the Volunteers in the Philippines were: Admission 1108.75 and death 1.98; for the regulars; 742.82 and 1.64 respectively per thousand of strength. Cuba followed with an admission rate of 581.35 and a death rate of 1.04. In Porto Rico and China the prevalence and mortality were relatively light. In the United States the admission rate was 166.20 and the death rate .05 per thousand of strength.

During the current year so much has been done in the practical application of methods for the prevention of malarial diseases, based on the diffusion of our knowledge of the means by which these diseases are propagated by infected mosquitoes, that a safe prognostication may be given of a lessened non-efficiency from these diseases in the next report of the Surgeon General of the Army.

Consumption. For tuberculosis of the lungs the admission rate for the year, 4.92 per thousand of strength, was much higher than the mean annual rate of the previous decade, 2.66. The rate of discharge for disability was 1.36 as compared with 1.40 for the previous ten years and the death rate .96 as compared with .48 as the mean annual rate for the decade. The admission rate was higher, 5.27, in the United States than in any of the other commands except that serving in China where a rate of 7.70 was recorded. The lowest rate, 3.80 was recorded in Cuba but this does not mean that the prevalence of consumption in the West India Islands is notably less than in the United States for the command in Porto Rico gave an admission rate of 4.59 per thousand of strength. It is believed that the sanatorium for consumptives recently established at Fort Bayard, New Mexico, will be of great value in the recovery of incipient cases of this disease.

Venereal diseases. The admission rate for these diseases for the whole army during the year 1900 was 133.97 and the discharge rate 2.36 per thousand of strength as compared with

133.00 and 2.61 during 1899 and with 71.45 and 1.22, the mean annual rates of the decade 1889-98. These large rates prevailed in all the commands except among the Volunteer troops serving in the Philippines, the admission rate for these having been 79.94 and the rate of discharge .41 per thousand of strength. Among the regular troops in the Philippines the rates were respectively 138.88 and .96; among troops serving in the United States 155.39 and 7.29. In China the admissions rose to 173.60 but there was no discharge for disability. In Cuba the admission rate reached 190.68 with 4.03 discharges per thousand of strength and in Porto Rico the excessive admission rate of 367.88 was recorded.

Since the close of the calendar year reports from the Chief Surgeon of the Division of the Philippines show these diseases to have increased materially in their prevalence. In April, 1901, they constituted 20.42 per cent of the total sickness as compared with 8.97 per cent in September, 1900. The Board of Health of Manila has instituted measures for the control of these infections among the women of the town including the segregation of prostitutes in a certain part of the city and a careful system of superintendence over them. Orders have been issued directing an inspection of the troops at regular intervals with the intention of detecting all diseased soldiers and sending them to hospital for treatment. The carrying out of these orders for the examination of all enlisted men has added to the sick list many cases that would have otherwise been treated privately and not appeared on the sick reports. Los Banos on Laguna de Bay which has hot springs closely resembling in composition those of the Hot Springs of Arkansas, has been selected as a suitable place for the treatment of syphilitics and some of these cases are now there undergoing treatment.

Similar efforts have been made in Cuba and Porto Rico to control these diseases.

Alcoholism. The admission rate for alcoholism in the Army as a whole during the year 1900 was 15.34 per thousand of strength as compared with 14.49 in 1899 and with 28.67, the mean annual rate of the decade 1889-98. Troops serving in

the United States during the past year had 22.43 admissions per thousand of strength. The steady decrease of late years in the admissions for alcoholism among the men of the Regular army is a matter for congratulation. Military officers may be said to be unanimous in their opinion that this was mainly the result of the establishment of the post exchange or canteen at military posts. The following shows this gradual improvement: Mean annual admission rate of the decade ending with 1889, 56.68 per thousand of strength. Admission rate for 1889, 41.41; for 1890, 40.73; for 1891, 40.01; for 1892, 37.23; for 1893, 33.97; for 1894, 30.94; for 1895, 30.11; for 1896, 29.06 and for 1897, 27.86. In 1898 the altered conditions consequent on the Spanish-American war prevented further comparisons. There is less drunkenness among troops in active service than in a command doing garrison duty in the times of peace. In the Philippines during the past year the admission rate for alcoholism among the Volunteers was 8.68 and for Regulars 12.41; for troops in China 7.70. These statistics do not sustain the newspaper reports of drunkenness among the troops in the Philippines. In fact medical officers report the habits of the enlisted men in the Philippines as very much the same as in the United States. Much of the evil effects of intemperance in the Philippines is attributed to the use of the native intoxicant vino which is a crudely distilled alcohol causing rapid intoxication which is readily recovered from when a moderate quantity is taken but which taken in excess causes wild delirium and unconsciousness and in habitual users induces a deterioration of the mental faculties.

Insanity. Of insanity 273 cases were reported, equivalent to an annual rate of 2.72 per thousand of strength. Of these cases 149, or somewhat more than one-half, were discharged from the service and sent to the Government Hospital for the Insane at Washington, D. C., for treatment. The remaining 124 cases were returned to duty at various periods after having been taken on the sick report. The admission rate in 1899 was 1.78 and the proportion of those sent to the Government Hospital formed .87 per thousand of the strength. The increase during the past year is explained by the nervous depression and home sickness among the relatively larger pro-

portion of the strength of the Army serving in the Philippines.

Diarrheal diseases. During the year 1897 when all the troops of the United States served at the home stations, the admission rate for diarrheal diseases was 73.77 per thousand of strength, with no death. Dysentery was a comparatively rare disease and seldom fatal. In 1898 as a result of war service in Cuba, Porto Rico and the Philippines the admission rate rose to 388.62 and the increased gravity of the cases was manifested by a death rate of 1.45 per thousand of the strength. During the following year, 1899, the admission rate was 380.69 with a death rate of 2.14. During the past year the admission rate increased to 465.01 and the death rate to 6.47 on account of the relatively large proportion of the Army which was exposed to the causes of diarrheal and dysenteric diseases in the Division of the Philippines. Among troops serving in the United States the admission rate was only 96.57; in Porto Rico 148.17 and in Cuba 166.75 and the death rates in these commands was relatively small. But in the Philippines among the regulars the admission rate was 488.25 and among the Volunteers 736.05, while among the troops engaged in the dangerous campaign in China it rose to 1266.54 per thousand of the strength. The heavy mortality rates occurred in these commands. Among the Pacific Islands the death rate was 7.47 per thousand of strength; among the Volunteers 10.88 and among the troops of the China Relief Expedition 15.92.

Diseases of the respiratory organs. Diseases of the respiratory organs among troops serving in the United States gave an admission rate of 76.48 and a death rate of .56 per thousand of strength.

Bronchitis gave a rate of 84.39 in the United States. The exposures of the troops during the active campaign in China caused a rate of 92.45 but in the islands this affection was infrequent, the rate in Cuba having been only 29.34, in Porto Rico 29.82 and in the Pacific Islands among the Regulars 34.59 and among the Volunteers 44.60.

Pneumonia also had its highest prevalence in the United States, 4.25 per thousand of strength, followed in China by a rate of 3.08 while in Cuba the rate was only 1.61, in Porto

Rico 2.29 and in the Pacific Islands 2.12 among the Regulars and 2.61 among the Volunteers. The death rate, however, from this disease was highest among the Volunteer troops in the Philippines, .76 per thousand men, as compared with .25 among the Regular troops serving with them and with .34 among the troops serving in the United States.

INJURIES. The admission rate for injuries in the Army, regulars and volunteers, in 1900 was 196.27 and the death rate 6.95 per thousand of strength, contusions and sprains contributing largely to the former and gunshot wounds to the latter.

Gunshot wounds. During the calendar year 1900, 377 men were killed by gunshot, 305 in action and 21 by accident; 30 of the deaths were suicidal and 21 homicidal. Besides the 377 killed by gunshot 1,173 cases were received in the hospitals for treatment; 782 were incurred in action, 315 not in action but in the line of duty, 57 not in line of duty, while 12 were suicidal and 7 homicidal.

Ninety-two of the 1,173 cases proved fatal; 70 of which were battle wounds; 12 received in line of duty; 3 not in line of duty; 4 were suicidal and 3 homicidal.

Of the total number struck by gunshot missiles 469, or 30.3 per cent. died from the injuries inflicted. The killed constituted 24.3 per cent of those struck and the wounded 75.7. One man was killed for every 3.1 men wounded. This is a much heavier death record than was given by the gunshot wounds of 1898 and 1899. During those years the killed constituted 11.9 per cent of those struck, the wounded 88.1 per cent. or one man killed for every 7.4 wounded.

Of the 92 cases which terminated fatally 28 deaths occurred among 35 penetrating wounds of the abdomen, a mortality of 80 per cent as compared with 70 per cent in the years 1898 and 1899. Laparotomy was performed in 4 of the 28 cases and an abrasion of the ileum was sutured in one of the 7 cases which recovered.

Sixteen of the 92 deaths occurred among 63 penetrating wounds of the thorax, a mortality of 25.4 per cent as compared with 27.8 during 1898 and 1899.

Fractures of the femur had a mortality of 19 per cent. caused by 7 deaths among 37 patients as against 11 per cent

in 1898 and 1899. During the past year, however, the total number of cases was smaller and the relative number of upper third fractures larger than in the years cited. Fractures of the knee joint had a mortality of 15 per cent.

The mortality in fractures of the spine constituted 69.2 per cent of the cases, 13, of which 9 were fatal; and fractures of the skull were 45.5 per cent fatal, 10 deaths in 22 cases.

Bolo wounds. Besides the gunshot wounds received in action the battle casualties of the year included 41 men killed and 83 men wounded mostly by bolo, kris or spear. Five of the 83 wounded died of their wounds.

Board for the Study of the Etiology and Prevention of Yellow Fever. In my last annual report I referred to the appointment of a board for the purpose of pursuing scientific investigations with reference to the acute infectious diseases prevailing on the Island of Cuba. This board, consisting of Major Walter Reed, surgeon, U. S. Army, and Contract Surgeons James Carroll, Aristides Agramonte and Jesse W. Lazear, U. S. Army, arrived at their station, Columbia Barracks, Quemados, Cuba, on June 25, 1900. Fortunately for the purposes of the board, an epidemic of yellow fever, which had begun in the adjacent town of Quemados, Cuba, during the latter part of the month of May, was still prevailing so that an opportunity was afforded for bacteriological and pathological observations in this disease. The results obtained were especially valuable showing that the bacillus icteroides (Sanarelli) bears no causative relation to yellow fever and that the mosquito serves as an intermediate host for the parasite of this disease. Further experiments of a most interesting character demonstrated that yellow fever is transmitted to non-immunes by the bite of a mosquito that has previously fed on the blood of those sick with this disease; that yellow fever can also be produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of the disease; that an attack of yellow fever produced by the bite of the mosquito confers immunity against the subsequent injection of infected blood; that yellow fever is not conveyed by clothing, bedding or merchandise soiled by contact with those sick with the disease; that a house may be said to be

infected with yellow fever only when there are present in it mosquitoes capable of conveying the parasite of the disease and that the spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.

The importance and far-reaching consequences of the observations made by Major Reed and his associates at Quemados, Cuba, can hardly be overestimated. For the first time in the history of this widely prevalent tropical disease we are in possession of knowledge with regard to the manner of its propagation which will enable us, I believe not only to check its ravages but to effectually stamp it out whenever it may appear in any of our garrisons or cities.

With the view of promptly arresting the spread of the disease full instructions were issued in a circular from Headquarters Department of Cuba for the information and guidance of medical and commanding officers. Already the authorities in the City of Havana, based on the work of Major Reed and his associates have resulted in practically ridding that city of yellow fever for the first time in more than one hundred and forty years.

Board for the investigation of tropical diseases in the Philippines. Much excellent work has been done by this board in the study of animal parasites, dysentery, fevers, bubonic plague and other tropical diseases, while some valuable reports have been received from medical officers not members of the board. Under authority from this office excerpts from the reports on these subjects were published in the form of circulars by the Chief Surgeon, Division of the Philippines, with the view of presenting to the medical officers of the Division the results of the investigations that had been made.

Circular No. I, by Lieutenant R. P. Strong, assistant surgeon, U. S. Army, published in February, 1901, discusses the subject of animal parasites. Circular No. II, also by Lieutenant Strong, published in April, 1901, gives full information concerning dysentery and its causes. Circular No. III by Lieutenant W. J. Calvert, assistant surgeon, U. S. Army, published in May, 1901, consists of an epitome of our knowl-

edge on the subject of bubonic plague. The value of these circulars has been so highly appreciated by medical men that calls for copies of them are constantly being received.

Exhibit of the Medical Department at the Pan-American Exposition, Buffalo, New York. The exhibit, which was in charge of Captain E. L. Munson, assistant surgeon, U. S. Army, consisted of a brigade field hospital of 100 beds, and was excellently located on a plot of ground immediately south of the Government Building, very accessible to visitors and of sufficient size not only to contain the hospital tentage without crowding but also furnish an adjoining space suitable for drill purposes. The hospital was fully equipped in all its details according to the provisions of the latest supply table; the purpose being to leave nothing to the imagination of visitors, the majority of whom would be unfamiliar with military matters, but to demonstrate the equipment of the Medical Department, in respect to the brigade hospital unit, in quantity, size and capacity as well as in form, variety and quality.

The number of visitors who have inspected the field hospital and witnessed the exhibition drills of the hospital corps is very great* and my expectation that this exhibit would prove an attractive and interesting as well as instructive feature of the Exposition has been amply justified. The character of the exhibit is such as would naturally attract military and medical men, and in addition, the recent war with Spain and hostilities in the Philippines and in China have aroused a general interest in military matters. A large proportion of visitors at the Exposition have had relatives or friends in the regular or volunteer forces and these, particularly the women visitors, have shown much interest in the methods and appliances by which sick and wounded soldiers are cared for by this Department in the field. As a means of educating the popular mind with respect to the efficiency of the Medical Department, this exhibit has thus been of very great value.

GEORGE M. STERNBERG.

[*In the note on this subject on page 306 of the present number of the JOURNAL, the types erroneously make the editor to say that as many as two thousand persons visited the exhibit in a single day. The fact is that no less than *twelve thousand* visitors were received on several occasions.—EDITOR J. A. M. S.]



COAT OF ARMS OF THE
MEDICAL DEPARTMENT,
U. S. ARMY.



Gen. H. Sternberg, Surg. Gen. U. S. A.



Original Memoirs.

RESUMÉ OF THE HISTORY OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY, FROM 1775 TO THE BEGINNING OF THE SPANISH-AMERICAN WAR.*

By LIEUT. COL. JOHN VAN RENSSELAER HOFF.

MEDICAL DEPARTMENT, U. S. ARMY.

FROM the beginning of the settlement of our country there was conflict not only between man and nature, but between man and man. Every settler from the force of circumstances became a soldier, and while organization for military purposes was necessarily of the simplest character, there was such organization, and doubtless the medical man was a factor in it. As the population grew, the little wars took upon themselves more definite form, the more venturesome of the people organized themselves into bands or companies, and from time to time regular troops were sent from the mother country, with the organization then recognized as most satisfactory.

With the outbreak of the War of the Revolution all that our people knew of military affairs came from the British, and it was not unnatural that such organization as was contemplated for the American army was modeled on that of their foes.

The history of the medical department of our army begins with the siege of Boston, in 1775. As Major Brown re-

*SOURCES OF INFORMATION:

History of the Medical Department, U.S.A., Brown.
Legislative History of the General Staff of the Army of the U.S.
The Army of the U.S., 1789-1896. The Medical Department, Smart.
The Medical and Surgical History of the War 1861-'65, etc., etc.

marks in his interesting sketch: "The force which gathered at Cambridge after the battle of Lexington was a spontaneous assemblage of the people and resulted from the burst of patriotism and alarm which swept throughout the country, calling the farmer from the plow, the mechanic from his shop, the clergyman from the pulpit, and the physician from the bedside of the sick." The men who thus collected at Cambridge were a heterogeneous mass without definite formation. There was no staff, but the practical necessities of the situation developed one, each member of this unformed mass being assigned to the special work for which he was best fitted.

The second provincial congress of Massachusetts Bay was at this time in session, earnestly occupied with the organization of troops, and it is not surprising that from the beginning they saw the immediate necessity for an organization for the care of the sick and wounded. It is interesting to observe that even at this time and under these conditions, its first enactment in this direction was to provide for the examination of all persons seeking appointment in the medical department. The first resolution relating to this matter was passed on the 8th day of May, 1775, as follows:

Resolved. That the persons recommended by the commanding officers of the several regiments be appointed as surgeons to their respective regiments, *Provided* they appear to be duly qualified on examination.

We find a note of interest in this connection in Thacher's Military Journal of the Revolutionary War, which reads as follows:

On the day appointed, the medical candidates, 16 in number, were summoned before the board for examination. This business occupied about four hours; the subjects were anatomy, physiology, surgery, and medicine. It was not long after, that I was happily relieved from suspense, by receiving the sanction, and acceptance of the board, with some acceptable instructions, relative to the faithful discharge of duty, and the humane treatment of those soldiers, who may have the misfortune to require my assistance. Six of our number were privately rejected as found disqualified. The examina-

tion was in a considerable degree close and severe, which occasioned not a little agitation in our ranks.

The organization of medical relief did not stop with the appointment of regimental medical officers, or the establishment of the regimental hospital. We find that after the battle of Breed's Hill a hospital was established in Cambridge under the celebrated Dr. John Warren. Hospitals were also established in neighboring towns, and even as early as the 27th of June, 1775, a contagious disease hospital was found necessary, showing how rapidly disease manifested itself in aggregations of raw levies.

The regulations for the medical department at this time were of an exceedingly simple character. On the first of July the Provincial Congress passed the following preamble and resolution:

In order that all the sick and wounded of the Army may be provided for, and taken care of, in the best way and manner possible:

Resolved, and it is hereby ordered:

That, when any person in the army is so ill, either by a wound or otherwise, that the surgeon of the regiment to which the sick or wounded person belongs, finds the sick or wounded as above said, cannot be properly taken care of in the regiment to which he belongs, said surgeon shall send the sick or wounded as above said, to the hospital provided for the use of the camps to which they belong; and a certificate of the man's name, and the company or regiment to which he belongs; and in that case, the surgeon of the said hospital shall receive the said sick or wounded under his care; and in case said hospital shall become too full, the surgeon of the said hospital shall send such of his patients as may with safety be moved to the hospital at Watertown, and a certificate setting forth the man's name, what company and regiment each belongs to; and in that case, the surgeon of the Watertown hospital shall receive such sick or wounded under his care.

The allowance of medical officers for the hospital was fixed at two surgeons and two surgeon's mates, and for a regiment in the field one surgeon and two mates, the pay of the former being \$40 per month and that of the latter \$22.50.

It cannot be imagined that this organization worked

without friction. It was a new machine driven by unfamiliar hands. Indeed we find it stated that notwithstanding the anxiety of Congress to provide for the sick, their efforts were by no means successful. An historian of this period says:

The vicious privilege, so fatal to all discipline, has been permitted of allowing the soldiers to choose their own officers, and these officers in turn had the nomination of surgeons, and too often personal popularity was sought for rather than professional fitness; a defect which was not entirely obviated by the examination to which all candidates were subjected. Again, surgeons and patients came from the same country village or town, and it took them a long time to appreciate the fact that the social equality which was to be admired in civil life, was incompatible with the discipline of the field.

General Washington had just been appointed commander-in-chief. Other staff departments had been organized, but the medical department had not thus been provided for; it was without a head. The commander-in-chief on July 21, 1775, thus expressed himself in a letter to Congress:

I have made inquiry into the establishment of the hospital, and find it in a very unsettled condition. There is no principal director, nor any subordination among the surgeons; of consequence, disputes and contentions have arisen, and must continue until it is reduced to some system. I could wish it was immediately taken into consideration, as the lives and health of both officers and men so much depend on a due regulation of this department.

But before this letter was written, Congress had appointed a committee to consider the method of establishing "the hospital," a term used to include the whole medical arrangement of the army. The committee reported a bill, which was agreed to, as follows:

That, for the establishment of an hospital, for an army consisting of 20,000 men, the following officers, and other attendants, be appointed, with the following allowances of pay, viz:

One director-general and chief physician, his pay per day, four dollars.

Four surgeons, each ditto, $1\frac{1}{2}$ dollars.

One apothecary, ditto, $1\frac{1}{2}$ dollars.

Twenty surgeon's mates, each ditto, $\frac{2}{3}$ of a dollar.

One clerk, ditto, $\frac{2}{3}$ of a dollar.

Two storekeepers, each four dollars per month.

One nurse to every ten sick, 1-15 of a dollar per day, or two dollars per month.

Laborers occasionally.

The duty of the above officers:—

The director to furnish bedding, medicines and all other necessities; to pay for the same, superintend the whole, and make his report to, and receive orders from the commander-in-chief.

Surgeons, apothecaries, and mates:—To visit the sick, and the mates to obey the orders of the physicians, surgeons, and apothecary.

Matron: To superintend the nurses, bedding, etc.

Nurses: To attend the sick, and obey the matron's orders.

Clerks: To keep accounts for the director, and storekeepers.

Storekeeper: To receive and deliver bedding and other necessities, by order of the director.

This very sketchy and unsatisfactory scheme would indicate that at this time Congress had very little idea of the magnitude of the struggle before them. However, it was a long step in advance; it was something definite.

Dr. Joseph Warren was proposed for the position of director-general, of the Army at Cambridge, but preferring an active command in the field he accepted a major general's commission, and it will be remembered was killed at Breed's Hill. The actual selection fell upon Dr. Benjamin Church, who, unfortunately for the department, proved recreant to his trust, and did little or nothing to improve the efficiency of his department. Dr. John Morgan, of Philadelphia, a man of large literary and scientific attainments, and who had had considerable experience in military sanitation gained as a medical officer in the struggle between the English and French for the possession of Canada, succeeded to the office of director-general. Dr. Stringer was appointed to the Army of the North and Dr. Rickman to that of Virginia. Dr. Morgan did much to introduce system into his department, but it can be well imagined that the situation was anything but desirable, and

in fact there is ample testimony showing that the sick and wounded of the war of the revolution were subjected to the greatest hardships. In spite of every effort on the part of Dr. Morgan, he was made the object of bitter attack not only within but without the Army. Material of all kinds was lacking; hospitals were destitute of everything needed to render the men comfortable; few of the surgeons had any instruments; medicines were very scarce; and surgical dressings were almost entirely wanting. In this emergency, Dr. Morgan successfully appealed to the charity and patriotism of the inhabitants of the surrounding country who so far as possible supplied the wants of the sick and wounded.

It will be interesting to observe that on the 2d March, 1776, out of an aggregate force of 18,524 men, 2,398 were present sick, and 367 were absent sick, or 15 per cent of sickness, which was nearly 25 per cent greater than at any time during the Spanish-American War.

After the removal of the headquarters of the army from Boston to New York, Director-General Morgan made a successful effort to improve his department, but experienced much trouble with the regimental hospitals. The medical officers complained that their pay was not sufficient to enable them to live like gentlemen, while the regimental surgeons were grieved because they thought they were too much subordinated to the general staff. It is interesting to observe in this connection how this same difference runs through the history of all our wars, and even as late as 1898 the question of the regimental versus the division hospital became a very burning one.

On the 17th July, 1776, the Continental Congress passed a resolution which increased the number of hospital surgeons in proportion to the increase in the army, not exceeding 1 surgeon and 5 mates to every 5,000 men, and increasing their pay $1\frac{2}{3}$ dollars per day and giving them rank above regimental surgeons and mates. It also authorized the employment of storekeepers, stewards, managers, etc., and required the rendition of accounts and weekly returns of sick, and forbade the

regimental surgeons drawing upon the general hospitals for hospital stores.

This law, while vaguely expressing the powers of the director-general, was a decided step in advance. Apparently Congress failed to foresee that other armies and departments beside those in Boston would be necessary, and that there should be one head—the director-general—over the medical departments of all armies. Indeed, Washington had some months before endeavored to impress upon Congress this fact, but here again was met the opposition of the regimental surgeons, nor were they without logic in their contention, for the regimental hospital, more properly called dispensary, occupies a very definite and important place in a well-considered scheme of military sanitary organization. To meet this condition, hospital regulations were issued, which were in the text stated to have been agreed upon between the director-general of the American Hospital and the regimental surgeons and mates, at New York, in July, 1776. These regulations provided quarters for the regimental hospital into which the sick of the regiment shall be admitted under authority of the regimental surgeons; that these surgeons should keep a register of all admissions and make a return thereof to the commanding officer; that they shall prescribe diet for the sick, and sign the provision return; that they shall not send any sick from the regimental to the general hospital without a transfer slip, neither shall they send those laboring under infectious or malignant diseases; that cooking utensils shall be obtained from the quartermaster's department; that upon the disbandment of the regiments the medical supplies shall be turned into the general hospital; that every regimental hospital shall have a cook, and one nurse to every ten men, who shall be paid a half dollar per week and rations; that it shall also have a corporal's guard of at least three men to keep persons from going in without orders to disturb the sick or to carry liquor to them. "The other persons whilst relieved from standing sentinel, to serve for the time as waiters, and obey the surgeon and mate, in respect to any assistance,

which may reasonably be required in behalf of the sick". Lastly, that in all cases not provided for by the foregoing, or any further regulations that may be agreed upon, the surgeons and mates shall observe the customs and usages of the British army, and shall at all times obey such orders as they shall in the way of duty receive from the director-general for the treatment of the sick or for the discharge of the duties of their station.

Owing to the want of a well-defined central authority, the bickerings of medical officers became more and more marked as the war progressed. The necessary organization of separate armies and the appointment of medical officers as chief surgeons without control from the centre, resulted in the utmost confusion and consequent failure, with crimination and recrimination from all sides.

On the 15th July, 1776, Dr. William Shippen, of Philadelphia, was appointed chief physician to the flying camp of 10,000 men, established at Trenton, N. J.; and Dr. Jonathan Potts was appointed to the Canada department, to succeed Dr. Stringer who had been appointed chief surgeon at the instigation of General Schuyler, and who before he was finally disposed of caused no little trouble in the department.

There was no further important legislation by Congress in 1776 regarding the medical department though some fifteen resolutions were passed. Early in 1777 Dr. Morgan, through a resolution of Congress, was dismissed from the office of director-general. This result followed the faulty organization, the extreme difficulties of the situation, and the disloyalty and opposition of the officers of his department. Unfortunately for Dr. Morgan the scandals became so great that a scapegoat was necessary, and he was selected. He was called on for his resignation, but refusing to resign was summarily dismissed. He remained under the stigma of dismissal for upwards of a year. At length, in 1778, he prepared an elaborate memorial in his defense which he transmitted to Congress, and which nearly a year afterwards received consideration, as is shown by the following resolution:



Whereas, by report of the Medical Committee, confirmed by Congress on the 9th of August, 1777, it appears that Dr. John Morgan, late director-general and chief physician of the general hospital of the United States, had been removed from office on the 9th of January, 1777, by reason of the general complaint of persons of all ranks in the army, and the critical state of affairs at that time; and that the said Dr. John Morgan requesting an inquiry into his conduct, it was thought proper that a committee of Congress should be appointed for that purpose; and whereas, on the 18th day of September last, such a committee was appointed, before whom the said Dr. John Morgan hath in the most satisfactory manner vindicated his conduct in every respect as director-general and physician in chief, upon the testimony of the commander-in-chief, general officers, officers in the general hospital department, and other officers in the army, showing that the said director-general did conduct himself ably and faithfully in the discharge of the duties of his office, therefore:

Resolved, That Congress are satisfied with the conduct of Dr. John Morgan while acting as director-general and physician in chief in the general hospitals in the United States; and that this resolution be published.

This was a very handsome apology for the wrong done, but it would have been more to the purpose if they had ordered the investigation before they disgraced him by a summary dismissal. Even now they did not restore him the position of which he had been so unjustly deprived, and he retired to private life, broken in spirit by the treatment he had received; a blow from which he never entirely recovered. He died on the 15th of October, 1789, at the age of 54 years.

Dr. Stringer, who was dismissed at the same time with Dr. Morgan, and who was the medical director of the northern army, was apparently more of a politician than a medical officer, and his dismissal was but tardy justice for continual neglect of duty.

The condition of affairs in the northern army at that time may be inferred from a report of the committee of Congress, from which I quote:

Your Committee beg leave further to report that they have visited the General Hospital for the Northern Army, situated at Fort George; that there is a range of buildings

Among the troops in the Jerseys the want of supplies caused great suffering. Three thousand men who were fit for duty were detained in the various hospitals because they had no shoes. Hospital stores were scanty and all available means of supply were exhausted. A severe winter was approaching and the sick were without blankets, many of them even without clothes. Every effort was made by the medical department to make up for this scarcity of material, but failed to check the growing discontent against its management. The sick could not believe that their distress was the necessary result of the impoverishment of the country, and they were unfortunately led by imprudent statements of many of the officers to think they suffered in order to enrich those high in authority. Even so sincere a man as Dr. James Tilton wrote that in the fatal year 1777 when the director-general had the entire direction of the practice in our hospitals as well as the whole disposal of the stores, he was interested in the increase of sickness and the consequent increase of expense, as far at least as he would be profited by a greater amount of money passing through his hands.

The director-general was vigorously attacked on all sides, and especially by officers of his own corps, Dr. Rush being an active opponent. "Whatever may have been thought of Dr. Rush's merits as a patriot, statesman, physician, and man of letters, it may be truthfully said that his military career was not a success."

As a result of further investigation of the medical department in the latter part of 1778, the regulations heretofore referred to were modified, looking in the direction of more strict accountability for public funds and property. In June, 1779, the complaints against the medical department, which centered in the person of its director-general, took definite form in the shape of charges of malpractice and misconduct in office, preferred by Dr. John Morgan, who himself had been dismissed the service, the result of which was a court-martial which honorably acquitted the director-general of every charge brought against him.

Again, on September 13, 1780, the organization and regulations governing the Medical Department were modified by an act of Congress, and Dr. Shippen was continued as director-general, and this law was again modified on the 3d of January, 1781.

The last act relating to the medical department during the Revolutionary War was passed on the 1st of January, 1783, and prescribed the pay of the different officers. During this year the reduction of the army took place rapidly and culminated the 2d of June, 1784, in the following resolution:

That the Commanding-Officer be, and he is hereby directed to discharge the troops now in the service of the United States except 25 privates to guard the stores at Fort Pitt; and 55 to guard the stores at West Point, and other magazines; with a proportionate number of officers; no officer to remain in service above the rank of captain, and those privates to be retained who were enlisted on the best terms: *Provided*, Congress before its recess, shall not take other measures respecting the disposition of those troops.

This act left the United States without an army. The sentiment against the maintenance of a standing army, inherited from our liberty-loving ancestors of the British isles, was from the very beginning strongly developed. Besides, the immense armaments of Europe were considered absolutely unnecessary in a country widely separated from possible enemies without. So that at the utmost, all that could be necessary would be a police force to protect our frontier from the savages. This idea has grown with our growth and remains to-day stronger even than at the end of the revolutionary war.

Until 1787 the emergencies of frontier savage warfare were met by calling upon the different states for levies, which were rapidly assembled, and having accomplished the object of the assembly, dispersed to their homes.

In 1797 war became imminent with France, and in 1798 the President was authorized to raise a provisional army of 10,000 men, with the necessary general and staff officers. In this act a physician-general was provided for, with the pay and emoluments of a lieutenant-colonel, which office was

filled by the appointment of Dr. James Craik, of Virginia, who it will be recalled was a medical officer in the revolution, and the personal physician of General Washington. It is interesting to observe at this time that the Hon. James McHenry, Secretary of War, who had served as a surgeon in the revolution, and well understood the importance of sanitary organization, wrote as follows:

The Secretary does not discover in any of the acts the necessary provision for the appointment of hospital officers or a hospital establishment. As military hospitals are indispensable to an army, especially in time of war, it is respectfully suggested that provision on the subject ought to be made by law, and that the regulations to be found in the resolutions of the old Congress, more particularly those under date of September 30, 1780, and January 3, 1782, as certainly the faithful results of much experience, may afford some important lights respecting this department. The certain consequences of disregarding so essential a measure in the event of war, and the encampment of an army, will be a train of diseases which must cut off a large proportion of our troops.

In consequence of this letter, Congress in March 1799, passed an act to regulate the medical establishment, which in its general features resembled the law of 1782. Fortunately, war did not result, and on the 15th of June, 1800, the troops, with certain exceptions, were disbanded, leaving in 1801 but 6 surgeons and 7 surgeon's mates, without any corps organization, Physician-General Craik having been mustered out.

With our extending frontiers, the necessity for an additional increase in the frontier police force became apparent, and surgeon's mates were from time to time added, until in 1804 the number was increased to 29. In 1808 various events occurred of a hostile character on the part of Great Britain which impressed the authorities with the necessity for increasing the forces against hostilities which seemed inevitable.

In point of medical organization, matters had not advanced since the revolutionary war. Nothing apparently had been learned from the vexatious controversies and sad failures of that war. The medical department remained without a clearly defined organization, with the certainty that the same

conditions would obtain in the pending war that had obtained in the previous war with Great Britain.

On January 11, 1812, Congress enacted that there should be appointed such number of hospital surgeons and mates as the service might require, with one steward to each hospital. It was the same old story: the experiences of the war of the revolution had been forgotten. No efficient army organization had been kept up; the staff departments were such as would be required for a force of but a regiment or two, without a central organization or system. Particularly was this true of the medical department, which had for all these years been represented by a few physicians scattered over the country, who were indeed physicians—not medical officers. The surgeons of the revolutionary war had left behind practically no record of their experiences in that war, nothing of the management of military hospitals, the police and hygiene of camps, the diseases peculiar to troops, and the surgical conduct of a campaign; so that in all essentials it was necessary to begin *de novo*. Speaking of the difficulties which had to be encountered, Dr. James Mann, chief surgeon of the northern army, wrote:

The mere organization of hospitals was the least perplexing part of duty. The ill defined powers with which the hospital surgeons were invested, even in their own department, subjected them to many disagreeable interferences of the officers of the line. Collisions will always exist between officers of different departments of an army, when their several powers and duties are not explicitly pointed out. Officers tenacious of authority assume as much as may be implied by rules and regulations. In addition to multiplied embarrassments, the various duties attached to the office of hospital surgeon with those merely professional, were always so pressing that little time was allowed to record particularly the diseases and medical transactions of the army, as they occurred.

The average number of men in the northern army during the summer of 1812 was 2,000, of which about 6 per cent were constantly sick from digestive disorders. No proper hospital accommodations were provided, and the sick were treated in tents. Later, hospitals were established along the northern

frontier, at Burlington, Vt., Plattsburg, Malone, and Buffalo, N. Y. Speaking of conditions obtaining at that time, we find the statement that—

The diseases of the troops composing the eastern division of the army were, as at Greenbush, intestinal disorders, to which was added in October the measles, which prevailed with such severity that nearly one-third of the total strength of the command was sick in November. As the winter advanced, pneumonia of a sthenic type became prevalent along the whole frontier, and there were upwards of 400 deaths from this disease alone during the winter in the two hospitals at Plattsburg and Burlington. It was especially noticed by the surgeons that those regiments suffered the most in which discipline was lax; the light artillery regiments had fewer sick than any other. Their quarters and encampments were generally in the best state; the men were mostly neat and clean in their dress and appearance. Of another case Dr. Mann remarks: There was one regiment on the frontier, which at one time counted 900 strong; but was reduced by a total want of good police to less than 200 fit for duty in the course of two months. This regiment in its appearance was at that time dirty in the extreme. * * * * * At one period more than 340 of this regiment were in hospital: in addition to these a large number were reported sick in camp. At the close of the war this regiment had established a high reputation. Its good discipline and bravery were excelled by none.

Fortunately the hospitals were abundantly supplied with everything necessary for the comfort of the sick, and the essential fault lay in the lack of proper organization. The experience in the campaign of the autumn and winter of 1812 and 1813 convinced Congress of the necessity for a more thorough organization of the staff departments, which resulted in the law of March 3, 1813, section 7 of which reads:

SECTION VII. And be it further enacted, That for the better superintendence and management of the hospital and medical establishment of the army of the United States, there shall be a physician and surgeon general, with an annual salary of \$2,500 dollars, and an apothecary general, with an annual salary of \$1,800; whose respective duties and powers shall be prescribed by the President of the United States.

Under this act, James Tilton, of Delaware, was appointed physician and surgeon general. At the time of the outbreak

of the war this officer wrote a work entitled "Economical Observations on Military Hospitals, and the Prevention and Cure of Diseases incident to the Army," in which he elaborated the plan for hospital organization presented by him to Congress in 1781. A review of the book which appeared in the Medical repository for 1813, says:

Dr. Tilton does not distinguish medical officers into physicians and surgeons, but considers them one or the other as circumstances may require. He proposes to establish a medical board in each military district or separate army, to be composed of two or more hospital surgeons and several regimental surgeons. This board is to have a field officer to sit as chairman, and meet monthly or oftener if necessary, by general order, to regulate the concerns of that department. This board is to examine and appoint all candidates for vacancies of hospital and regimental mates, with the consent of the commanding officer; to examine candidates for hospital surgeons, and recommend them to the physician and surgeon general for appointment, and establish rules for the medical department. The oldest hospital surgeon is to be the director of general of regimental hospitals in the army or district where stationed, and to act as prescribing surgeon only, without interfering in commissarial duties. His attention will thus be drawn to visit the several establishments for the sick within his charge, and as director to superintend their concerns. Such an arrangement is to prevent impositions on the government, and hereafter to procure surgeons adequate to their respective duties.

Instead of establishing extensive and costly buildings for hospitals, Dr. Tilton proposes to extend the circle of regimental practice and diminish the scale of hospital practice; thus if possible to prevent disease and ward off infection. His object is to have a harmonious understanding between the surgeons of the army, and by a proper regulation of the medical board, keep in check any disposition to throw the sick into general hospitals beyond moderation and propriety, whereby they must become crowded, producing the inevitable consequences of camp, jail, typhus, or hospital fevers, from which armies have suffered more than from their enemies.

Immediately after the passage of the above-mentioned act, the President caused to be issued rules and regulations for the army, those governing the interior economy of the medical department giving to the surgeon general power to

make rules for the government of hospitals, to appoint hospital stewards and nurses, to receive returns for medical supplies, etc., and for the sick in hospitals. These regulations also prescribed the uniform for the medical department.

The war of 1812 brought the same story of suffering. Surgeon Mann of the northern army wrote in 1813 during the month of August, as follows:

During the month of August an uncommon proportion of the army were sick or unfit for duty. More than one-third of the soldiers were on the sick reports. The officers shared with the privates in the prevailing diseases. Half of the medical staff attached to regiments were also unable to perform their duty. Of 7 surgeon's mates attached to the hospital department, one died and three had leave of absence by reason of indisposition; the other three were for a short period sick. So general was the sickness, the few remaining surgeons could not do full justice to their patients. At the time when the returns of the sick in the general hospital counted between 600 and 700, there were only three surgeons of this department present for duty. At this period of General Boyd's command, the troops were under excellent discipline, the encampment in good condition, and the men neat in their apparel. The general and regimental hospitals were reported during the summer months by the inspectors of the army, "in the best possible order."

The general hospital at Burlington, Vt., which was established by Surgeon Lovell, later under the command of Surgeon Wheaton, and ultimately of Surgeon Hunt in 1814, was apparently one of the best regulated of the military hospitals of that war. The history of this hospital bears evidence to the fact that zeal and intelligence, even under adverse circumstances, will bring satisfactory results, and that, after all, the man behind the hospital determines its efficiency or non-efficiency.

In December, 1814, a general order was issued from the War Office establishing regulations for the army, in which document the duties of the medical officers are for the first time clearly defined, under the headings, Hospital Surgeons and Mates; Hospital Stewards and Ward-masters; Regimental

Surgeons and Mates; Post Surgeons ; Apothecary General and his Assistants ; Miscellaneous.

With the close of this war, the army, including the medical staff, was again reduced, the surgeon general was retired to private life, and the central organization ceased to exist.

I cannot close this period of our history without inviting your attention to the following extract from a letter of Surgeon James Mann, medical director at Plattsburg, addressed to Surgeon General Tilton:

In events of high importance it is seldom the medical staff are noticed. This is discouraging to the ambitious young surgeon of the army. It may be alleged that surgeons being non-combatants are out of danger. This, however, is not always the case. During the investment of Plattsburg by the enemy, the surgeons were constantly passing from fort to fort, or blockhouse to dress the wounded, exposed to a cross-fire of round and grape shot; while the greater part of the army were covered by fortifications. The cool bravery of the surgeons was in private conversation noticed by the commander-in-chief; had half as much been reported to the War Department respecting them, they would have felt themselves amply compensated. While making this observation I do not include myself; because I was snug on duty at Crab Island, out of much danger while our fleet continued master of the lake. If reports honorable to officers are founded upon good conduct and cool bravery, who more deserving than the non-combatants? They have fewer motives to excite them, and are equally exposed to danger as officers of the line, whose minds as well as bodies, are constantly exercised by their commands. If any officer has hardships attached to his office, it is the surgeon who executes his duty with fidelity and assiduity.

I feel myself bound to report with much respect the conduct of all the medical gentlemen attached to this army, who have at all times during this campaign performed their duty; and who for their particular services during and after the investment of Plattsburg by the enemy, merit the applause of the country.

To discriminate would be an act of injustice. Doctors Lawson and Mason, surgeons of regiments, Warmley, Beaumont, and Hugo, surgeon's mates, have all deserved well of

their government. I would particularly mention Russell, hospital surgeon's mate, and Low, assistant apothecary general, (who volunteered his services,) for their attention and professional abilities at a time when the wounded of both fleets and army were placed under my charge; on whom were performed immediately after the action more than 30 capital operations. It is with much pride this opportunity is improved to state that the medical gentlemen of our army and navy were not inferior but superior to the medical gentlemen of the British navy; several of whom were made prisoners of war, and assisted to dress the wounded of their own fleet. This circumstance is very flattering to our infant medical institutions; and is good evidence, they are not less respectable than the ancient schools of Europe.

During many years following the war of 1812-15, the same patch-work legislation regarding the Medical Department continued. Appreciating the serious effect such had on the efficiency of the service, not only in the medical department but the entire army, numerous communications and reports were submitted from time to time, the most important of which was that of Dr. Joseph Lovell, chief medical officer of the northern department, written in 1817, giving in detail the causes of disease in the army and the duties and responsibilities of the medical officer. This report is well worth quoting in extenso, did time and space permit.

In 1818 Congress awakened to the necessity for a reorganization of the army, and passed a law reorganizing the general staff, which, so far as relates to the medical department reads as follows:

SECTION II. And be it further enacted, That there shall be one Surgeon General, with a salary of \$2,500 per annum, one assistant surgeon general with the emoluments of a hospital surgeon * * * * and that the number of post surgeons be increased not to exceed eight to each division.

Following this, the various incongruous offices of regimental surgeons and mates, hospital surgeons and mates, post surgeons, and assistant surgeons, were consolidated into a more homogeneous corps, resulting in general good, but in some personal discrimination which was the cause of much dissatisfaction.

On April 18, 1818, Surgeon Joseph Lovell was appointed Surgeon General of the army, Surgeons Tobias Watkins and John C. Bronaugh were made Assistant Surgeons General, and Francis Le Barron, Apothecary General, and James Cutbush and Christopher Backus Assistant Apothecaries.

Surgeon General Lovell was born in Boston in 1788. His grandfather was a distinguished patriot, taking a prominent position in the war of the revolution. The grandson was educated in Boston, graduating at Harvard University in 1807, and entered the army as surgeon of the 9th Infantry. He showed great ability during the war of 1812-15, and his appreciation of the requirements of the service as evidenced by his able reports on the various subjects connected therewith, indicated him to be the fittest person to assume the organization of the new department, and history tells us his appointment gave the greatest satisfaction to the army at large and to the medical staff.

It is not strange to find that the first point which attracted the new surgeon general's attention was the necessity for a revision of the medical regulations. Those of 1814, which were a decided advance in that they were something definite, were unfitted to the new organization of the corps. The nomenclature of diseases was so vague as to afford no reliable data on which to base an opinion as to the health of the army. The duties of medical officers and their relation to the new bureau required to be clearly expressed; the appointment of the assistant surgeons general as inspecting officers of the corps demanded attention to the subject of medical inspection, which had hitherto been to a great extent left optional with the directors of departments and divisions.

The new regulations were issued September 8, 1818, and their good effect was speedily seen in the improved character of the reports forwarded by the medical officers and the testimony received as to the increased efficiency of the department. These regulations, which prescribed in detail the duties of the different officers of the department, will bear close study. It is interesting to observe that they contain a prohibition

against the officers of the corps engaging in private practice. Although incorporated in the regulations of 1814, it had never been enforced. In fact, the position of the frontier posts and the comparative scarcity of physicians, 80 or 90 years ago, demanded, as an act of humanity, that the medical officer should professionally assist the citizens in the neighborhood of the garrison. Upon this subject General Lovell wrote that the regulation forbidding army surgeons to engage in private practice was intended to prevent neglect of-duty by entering extensively into it. He adds, "There would be no objections to this practice provided the officer desiring it would make an application to the Secretary of War through the Surgeon General, setting forth clearly the circumstances." The question of private practice is one that has been the occasion of a good deal of unfavorable comment on the part of line officers and of complaint on the part of civilian practitioners, so that the rule may be safely laid down that, except in cases of emergency or consultation, medical officers of the army should not engage in private practice.

When first called upon for a report, in November 1818, General Lovell made numerous recommendations, the principal one of which was that the pay and number of medical officers be increased. It may well be imagined that the indefinite status of army surgeons up to this period had created many misunderstandings and much dissatisfaction. They were in the army but not of it. They were without rank and had few rights that any one was bound to respect. In 1819 the question of quarters became so imminent that the following order was issued:

ADJUTANT AND INSPECTOR GENERAL'S OFFICE.

March 22, 1819.

General Orders:

The Medical Department of the army will be governed in their relative rank as follows:

Surgeons of regiments will have precedence over post surgeons, and post surgeons will have precedence of regimental mates; in their several grades, further reference will be had to date of commission.

In their choice of quarters, the Medical staff will have

precedence of subalterns, under the direction of the commanding officer (who may always claim precedence of those under his command).

Medical and hospital supplies are not to be detained or diverted from their destination, except by generals of division and commanding officers of departments, in cases of emergency and absolute necessity, when a report will be promptly made to the Adjutant and Inspector General, that further orders for deficiency may be given.

While the act of 1818 has generally been considered as the commencement of the modern history of the medical corps of the U.S. Army, it was really not until the reduction of the army in 1821 that it assumed the form which it has retained without any decided alteration to the present time.

The history of the Medical Department from this time to the declaration of war against Mexico though not eventful, is a record of arduous and irksome duties during active hostility in the unhealthy stations in the cypress swamps of the everglades of Florida.

From time to time laws were passed by Congress which in certain respects modified the organization. In 1825 a law was enacted which specifically provided that no one should receive an appointment as assistant surgeon until after an examination by a board of three medical officers, detailed by the Surgeon General, which however was not put into practical operation until 1832, when an order was issued fixing the requisites for appointment. This same year a regulation was promulgated authorizing medical officers to be detailed as judge advocates of general courts martial.

It can be readily imagined that the question of pay and emoluments of medical officers had become of serious importance. The demand for men of a high grade of professional attainment made by the examining board was inconsistent with the emolument then paid. The expenses of medical officers at frontier posts were very great. They had no extraneous sources of income in the way of private practice and their compensation remained the same as that fixed in the Act of 1808, while the nature of their duties had been greatly extended by subsequent enactments. In the line of the army

during this time there had been a considerable increase in the pay, but not so in the Medical Department. The result was that resignations became so frequent as to seriously impair the efficiency of the department. The Surgeon General made frequent reports and recommendations upon this subject, calling the attention of Congress and military authorities to the injustice to the officers and the serious results to the service in the failure of Congress to properly remunerate medical officers, in which he did not forget to state that the medical officer was required to be a regular medical graduate as a prerequisite to appointment in the department, and that all of the expenses of a liberal education including a collegiate and medical course were paid by himself; while on the other hand a military cadet who ultimately becomes an officer of the line and other staff corps is prepared for service at public expense. Still Congress did not respond. Honorable Lewis Cass, Secretary of War in 1831, says of the medical department: "There is no portion of the army whose compensation is so inadequate nor is there any which presents less prospects of reward." Again in 1831 he wrote: "The prospects of gradual and continued promotion held out to the other officers of the army, is a powerful incentive to good conduct, and when realized becomes its just reward. Of this the medical officers are deprived, for the slight difference in rank and pay at present existing is scarcely worthy of consideration; the nature of their profession requiring time, experience and pecuniary means for its acquisition; the responsible and arduous services demanded of them; the relation, not always a pleasant one, in which they stand to the line of the army; and I may add in justice to this meritorious class of officers their general capacity, respectability and good conduct, entitle them to a higher rate of compensation." Even the line of the army appreciated the invidious distinction made against the Medical Department, and presented petitions to Congress, asking regulation of its claims, of the most convincing character. Notwithstanding this it was not until June, 1834, Congress finally passed a bill increasing and regulating the

pay of the Medical Department, which reads as follows:

SECTION I. Be it enacted, etc., That from and after the passing of this act, no person shall receive the appointment of assistant surgeon of the army of the United States, unless he shall have been examined and approved by an Army Medical Board, to consist of not less than three surgeons or assistant surgeons who shall be designated for that purpose by the Secretary of War; and no person shall receive the appointment of surgeon in the army of the United States, unless he shall have served at least five years as an assistant surgeon, and unless also he shall have been examined by an army board constituted as aforesaid.

SECTION II. And be it further enacted, That the surgeons in the army of the United States shall be entitled to receive the pay and emoluments of a Major; and the assistant surgeons who shall have served five years, shall be entitled to receive the pay and emoluments of a Captain; and those who shall have served less than five years, the pay and emoluments of a First Lieutenant; and that said assistant surgeons shall be entitled to receive the same allowance for forage as they are at present entitled to.

SECTION III. And be it further enacted, That every surgeon and assistant surgeon who shall have served faithfully ten years in these grades respectively, shall be entitled to an increase of rations per day, equal to the number of rations to which he may be entitled under this act."

In the mean time, during several years preceding the passage of this law, the usual efforts were made to reduce the army, with a view to economizing the public expenditure. While such a course is most laudable if properly directed, it must be realized that the first consideration should be efficiency, and no army, or department thereof, that is not thoroughly efficient is of much value. In support of this position many reports were submitted by the Surgeon General, which apparently were not altogether acceptable, for it appears that the Secretary of War not only failed to appreciate them, but in an elaborate report on the subject of our army organization, the only reference he made to the Medical Department was as follows:

The Surgeon General of the Army might be dispensed with. He has no disbursements to superintend or make, no bonds

to receive, no accounts to revise or responsibilities to encounter. The principal and material duty to be encountered by him is in the purchasing and distributing of medicines, a duty which is performed by a quartermaster of the army at New York, at which place medical supplies are obtained, and from which point they are distributed to the several posts.

It may easily be imagined that this recommendation was keenly felt by General Lovell, and in reply thereto he addressed a communication, which was transmitted to the House of Representatives, through the Secretary, in which he gave the history of his department since his appointment. Fortunately the Secretary's recommendation did not prevail.

Although the regulations of 1825 provided for examination for appointment in the Medical Department, as previously stated, it was not until December 13, 1832, that a board was convened for the examination of candidates for appointment. This board assembled in New York, where it continued with varying personnel to meet in annual session from that time until the organization of the Army Medical School in 1893, since which time it has met in Washington. The necessity for a strict physical and moral examination, although such was not at first demanded, soon impressed itself upon the members of the board and resulted in the promulgation of a rule which required the examiners to take into consideration the physical qualifications and moral habits as well as the professional acquirements. In this connection I venture to quote from the report of the President of the Board:

In ascertaining the professional attainments of candidates it became at first the duty of the Board to decide on the mode of conducting the examinations. The most important step was to arrange the branches in which examination should be held.

As the branches of practical medical science are now conventionally and very positively established, there was no difficulty or doubt in arranging them.

They were divided by the Board as follows:

1. Anatomy and Physiology.
2. Surgical Anatomy, the Principles of Surgery, Operative Surgery.

3. The Theory and Practice of Medicine.
4. Obstetricry.
5. Materia Medica and Pharmacy.
6. Chemistry.
7. Medical Jurisprudence.

That the first three divisions are essential to the army medical officer none can doubt. It was therefore required that in all these branches the attainments of the candidates should be unquestionably respectable. The fourth division, Obstetricry, refers to a class of patients not recognized by army regulations as within the specified duties of a surgeon. Yet universal usage, the dictates of humanity, a high sense of professional pride and duty concur to place the families of officers and soldiers in a moral relation to the army surgeon deeply interesting to them and him; binding him to them as strongly as though that relation were of military obligation. Nothing can add to the interest which the good surgeon feels towards that class of persons; therefore Obstetricry becomes an important branch of practical medical science in the view of the Board. Of Materia Medica it suffices to say, that to be properly acquainted with surgery and practical medicine implies a suitable knowledge of the articles used in treating injuries and disease. Therefore examination was not so minute in this branch as in the preceding. The candidates were questioned almost exclusively on what is termed Medical Chemistry; and Medical Jurisprudence was referred to only as it practically involved the interests and fate of its subjects.

It will be hence seen, that if to some branches primary and essential importance be ascribed, from no recognized branch of practical medical science was due or relative consequence withheld. The relation strictly maintained, was that of foundation and superstructure.

The examinations were long and patiently conducted. Two sessions were allotted in every case except one, and part of three days were given to that case.

Every effort was made to render the examinations unembarrassing. Perspicuity and precision were constantly studied; and in no instance was the candidate occasioned the least perplexity. It was well ascertained that the scope of every question was perfectly understood by the candidate. It was a leading feature in the examination that they were confined to subjects of practical importance. All speculative or abstract discussions were avoided.

It was stated to the candidates that in answering ques-

tions and in giving their opinions, they might refer to any respectable authority; and that the board would highly regard inferences drawn from experience. Liberality on these points was not at all incompatible with an exercise of the critical judgment of the Board. The examinations were minute, because positive and particularly because relative merit could only be thereby duly developed.

Finally, the examinations were thus plainly, impartially, practically and deliberately conducted, that the candidate if rejected, might *be convinced of his own incompetency*. That this expectation was not unwarrantable is fully established by several cases.

In illustration of this point, and to anticipate somewhat, I will read a letter addressed to the Secretary of War by Surgeon General Lovell of the date of August 12th, 1837.

In reply to your question touching the nature of Dr. N——'s complaint, I have to say that from his communication I cannot exactly discern what he means or what he wants.

All that I can learn from his incoherent language is that the Army Medical Board and himself are at variance in opinion as to his talents and attainments, and that he has raised a complaint against the Board for not accepting his word and the negative testimony of his friends as evidence of his qualifications to practice physick and surgery in the army of the United States. Dr. N—— has brought himself to believe that the letter of invitation to appear before the Medical Board is a letter of appointment; that the examination is a mere matter of form not at all calculated to affect the appointment; and that the Board has done violence to his rights as a citizen in withholding from him a passport into the army. Under this view of the subject he has conceived the idea of forcing his way into the army through the medium of political influence, and hence these threats of vengeance, this show of violence. Dr. N—— has however no cause of complaint nor ground upon which to base a charge against the Medical Board; and his murmurs can be silenced and himself strangled to death without an effort on our part. If faint praise can dam a man, he was completely cursed by those who pretended to recommend him to the consideration of the Department, and should not have been taken up as an accepted candidate for appointment to the Medical Staff of the army.

Dr. N—— has been twice examined and in both instances greatly failed, and from my own knowledge of him I am free to say, that he can never reach the lowest niche even on the

standard of merit which has been reared by the Army Medical Board.

In 1832 the Black Hawk war occurred, which was known as the cholera campaign and during which this disease was very widely disseminated throughout the country through the instrumentality of the troops. The history of this campaign from a medical standpoint is most interesting and will bear close study.

In 1835 occurred the Seminole war, following the Dade massacre. Troops were hurried to the scene of hostilities from all parts of the country. It is interesting to note that a regiment of volunteers was raised in Louisiana of which the then Surgeon Thomas Lawson was offered and accepted the Lieutenant Colonelcy, in which position he rendered efficient service. At the muster out he was assigned as medical director in Florida. As usual, in consequence of the war, the demand for medical officers was very great and many posts throughout the country were deprived of medical attendance to meet the necessities of the troops in the field. This having been brought to the attention of Congress eight additional medical officers were authorized by act of July, 1836. The accomplishment of this was almost the last official act of Surgeon General Lovell, who died on the 17th of October of that year. Throughout his official career he had gained the universal respect, admiration and affection of all with whom he had associated. In 1842 the officers of the medical corps testified their appreciation of his virtues by the erection of a handsome monument over his grave in the Congressional cemetery here.

The army almost as a unit desired the appointment of Surgeon Thomas Lawson, then senior surgeon, as surgeon general in succession to General Lovell. Very many of the officers including all those of high rank united in petitions to General Jackson to appoint Dr. Lawson. At length on the 30th of November, 1836, he received the appointment, much to the satisfaction of the officers of his corps, who had been extremely apprehensive that the great political influence that

had been brought to bear would result in the appointment of some one from civil life. General Lawson, however, did not enter upon the duties of his office until the spring of 1837; he having been ordered in the meantime by the War Department to organize a battalion of New York and Pennsylvania volunteers for service in Florida. His admirable record, large experience in all departments of the service under all circumstances gave great promise of his value to the Medical Department of the army in his new position. How well this promise was fulfilled may be learned by study of the history of the department under General Lawson's long administration.

In 1840 a new uniform was adopted for the medical department. The board which recommended this uniform had at first given the medical officer the aiguillette, but not epaulettes. To this many of the medical officers strongly objected and appealed to General Lawson, who addressed the Adjutant General of the Army as follows:

Dr. King informs me that you have expressed a wish that I should call with him on the Secretary of War, and speak to him on the subject of epaulettes for the Medical Staff.

As it is unusual for a subaltern officer to dictate to his chief, I have upon reflection come to the conclusion that it is better for me not to suggest anything to the Secretary in relation to a change of uniform.

I have been twenty-six and more years in the military service of my country, and very generally with troops on the frontiers and in the field.

I have been on the theatre of immediate action in every war in which the country has been engaged within my period of service, whether with a civilized or savage enemy, except that with Black Hawk, and then I volunteered my services for the field, but could not obtain permission to leave my station.

I have acted as quartermaster and as adjutant, and have been for months at a time, in command of a company of men in the regular army. I have also commanded a battalion and a regiment of men in the volunteer service, and have led them to the theatre of war; in the first instance under a commission from the executive of the State of Louisiana, and on the last occasion by the almost unanimous consent of the officers and

men who served under my orders; and although my services have not been attended with such brilliant results as those of some other persons, my military career has certainly not been discreditable to myself, or altogether unprofitable to the government.

If under these circumstances the commanding general of the army could feel himself justified in putting me off with an aiguillette, a piece of tinsel on one shoulder, while he decorates every brevet second lieutenant with an epaulette on each shoulder, and the staff lieutenant with an aiguillette besides, I must be satisfied to remain without a military dress.

As I am a soldier in feeling and somewhat in practice too, I should be gratified with having the privileges of a military man in the way of dress even; but if I am never to wear an epaulette until I ask for it, my shoulders will never be decorated with that badge of distinction. All that I have to ask is, that I shall not be compelled to wear the prescribed uniform, a demi-military dress, alike unsuited to my taste and to my feelings, nor forced to follow in the train of a general officer, on gala days, or in procession. As a citizen with plain clothes on, I can command respect, and feel that I am respected; but to be brought in contact with military men, on certain occasions, with half a uniform on, and the only chief of a military bureau in the same predicament, I could not but be conscious of my inferiority, and must therefore beg leave to be saved from the necessity of experiencing such a state of mortification.

The subject of a new uniform was broached by me the other day, at the pressing instance of a number of members of the medical staff; and as these officers are constantly present on duty with the soldiery, many of whom are not disposed to pay homage to, or yield prompt obedience to any person who does not wear the badge of military rank, the good of the service would seem to call for a respectful consideration of their application for a strictly military dress.

The rigid rules of military service having been already dispensed with in order to decorate the persons of platoon officers with two epaulettes, who before were entitled to one only, either on the right or left shoulder, there can not be any great military impropriety in extending the indulgence to those staff officers, who, although they have not military rank proper, must in the regular discharge of their duties necessarily command, or have military control over non-commissioned officers and privates, and also over the commissioned officer when sick and in hospital.

Epaulettes would embellish the person, and thereby gratify the pride of these officers (whether foolish pride or not is immaterial to the question) without doing a jot of injury to the discipline of the army, or interfering at all with the rights or with the dignity of a single officer with military rank. And if these indispensable officers, and I am free to say, intelligent, zealous and efficient members of the Medical Corps (the surgeons and assistant surgeons) can be brought to set a higher value on their commissions, or to feel better satisfied with their condition in the army, at so small a cost as the privilege of wearing epaulettes, the indulgence surely should not be withheld.

This remonstrance had the desired effect, for on the appearance of the new uniform regulations the coveted decoration was procured for medical officers as well as the other officers of the army.

At the close of the Florida war in 1842, the Medical Department was reduced by two surgeons and ten assistant surgeons.

It may easily be imagined that the question of relative status of Medical Corps versus Line and other corps had from the organization of our army—as in all armies—caused no little friction. The official relation of the medical officer was at this time by no means well defined. He was without actual rank and the definition of assimilated rank was never made clear. Regulations prescribed that on certain boards and councils line and staff officers should be detailed. The line claimed that medical officers having no actual rank could not preside over such councils as that involved exercise of military command which they were forbidden by law to have. In the revision of the statutes of 1840 there was incorporated a paragraph, which expressly denied the right of any staff officer to preside over a board of survey or council of administration, though they were still liable to detail as members. This resulted in an indignant protest from officers not only of the Medical Department, but of the line, and resulted in a very vigorous letter from the Acting Surgeon General under date of November 4, 1841. For a number of years this continued to be a burning question eliciting very able papers from some

of the most distinguished members of the corps, notably, Mower, Tripler, and Heiskell. This was a formative period during the piping times of peace when the small things of life became unduly important. For example, the question of salute was decided as follows: Surgeons are by regulations classed with majors in regard to certain matters of allowance as quarters, etc., and they are entitled to precedence as such in mixed boards; but not having the military "rank" of "field officers," they are not entitled to the salute prescribed for majors. The position of medical officers on parade for muster, inspection, reviews, etc.; whether it has been customary for the medical officer to appear in full dress at parade and for punishment of prisoners, etc., etc. In 1845, the question of the propriety of a medical officer engaging in private practice, was brought to the notice of the department to decide, in consequence of a protest forwarded by private physicians at Sacket's Harbor. These protests were replied to by the Acting Surgeon General as follows:

Your communication, without date, to the Secretary of War, representing that Dr. Foot, the surgeon stationed at Madison Barracks, and Mr. Veits, the hospital steward of the post, come in "competition" with you in the practice of the adjacent village and country, and asking for the interposition of the Department of war in the matter, has been referred to this office.

Whether, by your expression, "putting themselves in competition" with you, you mean to convey anything more than that they comply with the applications of those who desire their professional aid, is not clearly understood. If neither a breach of professional etiquette, nor any improper means to obtain professional employment is charged against them, it is not perceived that this Department can with propriety interfere in the matter. In the absence of reasons such as have been stated, the only other, and indeed the principal circumstance that would seem to call for the restraint of authority in the present case would be, that they neglect or have neglected their official duties by engaging in private practice. This you have not alleged; and as no report has been made upon the subject by their commanding officer, it is to be presumed there is no cause for complaint on that score. Indeed the elevated character and fidelity of the officers of the Medi-

cal Staff afford satisfactory guaranties that this will seldom, if ever occur. If, however, they should so far forget what is due to the government and expected of themselves, as to engage in private practice to the neglect of the officers and soldiers who are dependent on them for medical aid, they can be readily checked by their immediate military commander; and if they should persist in this dereliction of public duty, they can promptly be brought to trial before a military tribunal.

When therefore, it does not interfere with their military duties, medical officers have a right to give their professional advice, etc., to whomsoever they please, and they have always been permitted to do so with a view to their professional advancement. Indeed at military posts occupied by a small number of troops, and where of course the subjects of disease are few in number, and the complaints of these few present but little variety of character, it is rather desirable than otherwise that the army physician should extend his sphere of action to the citizens immediately around him, so as to become familiar with disease under all circumstances, the maladies prevailing throughout the country and among the citizens generally, as well as the diseases peculiar to the soldier, or to military life in camp or garrison. To deprive the army surgeon of any reasonable opportunity of practical advancement in his profession, would surely be inflicting an injury upon the service generally, and especially upon those who have to depend upon him for professional aid.

Again, while this Department in its reply to your communication desires to confine itself strictly to official considerations, or such as affect the public service merely, it may not be out of place incidentally to state, that to prohibit a medical officer (when his public duties will permit) from extending relief to those of his fellow citizens who may apply for his services—having confidence in his professional attainments—would be as ungracious to them as it would be devoid of the common dictates of humanity; and might afford as just and perhaps a better cause for complaint on the part of the neighboring community than the one alleged by yourselves, which relates exclusively to private interests.

In reply to your proposition that you may be permitted to come in competition with them (the surgeon and steward) inside "the garrison", and "the amount of our (your) services to be deducted from their pay". I beg leave to say that as there are generally a number of persons at a military garrison, who receive the professional services of the surgeon only by right of courtesy (which has always however been regarded as ob-

ligatory), they are entirely at liberty if they think proper to employ you; and as far as the discipline of the service will permit and my jurisdiction extends, I can offer no objection to their so doing; but as the pay of the surgeon and steward is fixed by law, it is not competent for the Department to order you to be paid for your services in the manner you propose."

But the period of small things was rapidly passing. The threatening aspect of affairs with Mexico necessitated the concentration of a large body of troops on the border, and all was activity.

On the 13th of May, 1846, President Polk issued a proclamation announcing to the people of the United States that Congress had declared "By the act of the Republic of Mexico, a state of war exists between that government and the United States."

The history of this war is one of interest to the students of military sanitation and much in it could be found to reflect great credit upon the medical officers of the army, not only as military sanitarians, but as soldiers. The act of May 13, '46, called for fifty thousand volunteers which were to be supplied with medical officers on the basis of one surgeon and one assistant surgeon to each regiment. In December of that year Surgeon General Lawson left Washington for New Orleans on official business. On his arrival in the latter city he was invited by General Scott to accompany him on his projected campaign in Mexico as chief of his medical staff; an invitation which was promptly accepted. During his absence from Washington, Surgeon Heiskell performed the duties of Surgeon General.

On the 11th of February, 1848, was passed the most important law since the organic act of 1821. This act reads: * * * subject to the provisions of an act entitled "An act to increase and regulate the pay of the surgeons and assistant surgeons of the army, approved June 30, 1834;" and that the officers whose appointment is authorized by this section, shall receive the pay and emoluments of officers of the same grades respectively; and that the rank of officers of the Medical Department of the army shall be arranged on the same basis which at present determines the amount of their pay and

emoluments: Provided, That the medical officers shall not in virtue of such rank be entitled to command in the line or other staff departments of the army.

The proviso of this act would seem to be superfluous. No staff officer can command unless specifically assigned to command by the Secretary of War. As to the legal right of the Secretary to assign medical officers to any duty which in his judgment they can perform,—that was settled by the act approved Oct. 1, 1892, which reads:

“That medical officers of the army may be assigned by the Secretary of War to such duties as the interests of the service may demand.”

The regulation covering this point, paragraph 18, remains the same to-day as it was in the beginning. It may be interesting to observe that medical officers neither claimed nor desired any right to command outside of their own department. They did, however, demand the same right of independence within their own department that was extended to other branches of the service and the recognition that a medical officer was something more than a civilian employee of the government authorized by courtesy to wear a uniform. This bill for the first time placed the medical department on an equality with the other staff departments.

I have thus far been unable to find any detailed accounts of the methods of organization and administration of the medical department during this war. There were general hospitals; presumably regimental hospitals; probably brigade hospitals. There was no less sickness in this campaign than others of which we have record. Apropos to this I venture to quote in extenso the report of Surgeon R. S. Satterlee, one of the distinguished officers of the medical department and at that time senior surgeon of the first division:

In obedience to your instructions that I should report for the information of the General-in-Chief the probable causes of the great amount of sickness and mortality prevailing among the troops, I proceed to state that sufficient causes of disease exist, and have existed since and during the siege of Vera Cruz, to account for all the sickness that prevails; and not a few of these causes have been spoken of, both in the

reports of the medical officers of the first division and in their conversations and often by them deplored.

To prove the above position, it is only necessary to give a brief history of the operations and changes of the division from the time it left Vera Cruz until the present time.

1. The division left Vera Cruz with the most limited means of transportation, not being allowed to bring even their tents; in consequence of which they have been obliged to bivouac in all situations from the 'Tierra Caliente' to the cold and elevated positions of Jalapa, Las Vegas and on the march to this place. This would under any circumstances produce diseases of the thoracic and abdominal viscera from the great change of temperature, and when it is recollected that many of the men were without blankets or great coats, having providently thrown them away while exposed to the scorching heat of the sun in the low country, or while hurrying to the support of the advance on the day of Cerro Gordo, I think the position will not be denied.

2 The almost total change in the character of the rations issued to the troops, while on board the transports and during the siege operations before Vera Cruz. They were almost exclusively confined to salt meat and hard bread, without vegetables, so far as I know, except beans and rice, not even the antiscorbutics allowed by regulations except in rare instances. This when a march into the country was commenced, was changed for fresh mutton, pork and beef (the latter always of inferior quality), and instead of the hard bread, always considered healthy when good, in several instances flour has been issued, and since our arrival at Puebla, Mexican bread, which experience has taught us is not healthy, at least for us, and the unrestrained indulgence in crude and unripe fruits, and the vile liquors, both distilled and fermented. All this is without doubt a fruitful source of disease.

3. The quarters that the troops occupy are undoubtedly far from being healthy. Many of the rooms are low and damp, and almost without ventilation, and in many instances surrounded by high walls which exclude in some degree the fresh air; in other cases the men are quartered in long entries, through which there is a rush of cool air, rendered more unhealthy by having passed through damp places. In some instances the men are greatly crowded, nearly three times the number of men allowed by regulations for hot climates living in one room. Almost, if not all of the quarters have thick stone walls with floors of the same material, or brick, upon

which the men sleep with only a mat under them (and that but recently), and with scant covering. This the men now suffer, and did at Perote, and the first brigade and light troops of the division, while at Tepeahualco had added very bad water from brackish wells. These things, I think can not be denied to be prolific sources of disease.

4. The unacclimated state of many of our men and their ignorance of a soldier's life. Nearly if not quite two-thirds of some corps are recruits. In one regiment that has lost fifteen men since our arrival in Puebla, thirteen were recruits, and the character of the recruits that have recently joined is of such a nature that disease and death must be expected among them. Many of them are boys entirely too young to undergo the hardships of a soldier's life, while others are old and worn out men who should never have been enlisted.

5. The great want of personal cleanliness. Many patients are received into our hospitals who probably have not washed their persons for months, and who for weeks have not changed their underclothes, and who are not only filthy but covered with vermin. This remark does not apply of course, to our old brave and faithful soldiers who are an ornament to any service, but particularly to the recruits, a great part of whom are indolent and of course filthy. Now, it is impossible for men to be healthy under such circumstances-

6. The rainy season, exposure to the warm sun in the morning and cold damp atmosphere at night, is exceedingly deleterious.

7. The great elevation of our position. The rarified air permitting no evaporation from the surface, the skin becomes dry and feverish as well as inactive, the natural excretions of the body are of necessity thrown upon the thoracic and abdominal viscera, the large glands from this over exertion and excitement become torpid and refuse to perform their functions, hence the great amount of bilious derangements, etc.

The above statements I have drawn up in obedience to your orders. I consider them to be very plain facts open to the cognizance of the most common observer who will take the trouble to investigate them. They are the concerted opinions of all the medical officers of the division and have often been the subject of conversation, as well as of official reports.

Surgeon Tripler wrote under practically the same date that in his opinion the causes of the diseases so extensively prevailing among the troops were, first, the inferior physio-

al constitution of many of the men; the rapid transition of climate; deficiency of clothing; the violent change of habits the recruit must undergo in becoming a soldier; the neglect of personal cleanliness; the unsanitary condition of quarters; inappropriate food, and finally climatic influences.

The same reasons are applicable to every war of which we have record. The yellow fever broke out with great severity at Vera Cruz; but everywhere we find commendation by the commanding officers of the excellent work done by the medical staff—Tripler, Randall, Cuyler, Keeney, Hammond, Swift, and a host of others.

Colonel Lugenbeel wrote as follows of Assistant Surgeon William Roberts at the battle of Molino del Rey:

At the battle of Molino del Rey, Doctor Roberts established his attendants in the rear of the regiment in a slight hollow, so as to be protected from the fire of the enemy. When the line was formed and advanced upon the enemy I did not notice the doctor. Very soon afterwards I saw Lt. C. S. Hamilton, fifth infantry, who commanded company "I" of that regiment stagger, and fall as if severely wounded. Assistant Surgeon Roberts ran up to him from the rear and after examining his wound said something to him and then started for the line of battle. I called to him to go back, but he pointed to Hamilton's company and ran on. The next I saw of him he was lying down on the field of battle with the wound in his forehead which afterwards caused his death. When I saw Hamilton I asked him about Robert's singular conduct, and he told me that Roberts came and examined his wound, and told him to go to the rear where his stewards and attendants were, and that he (Roberts) would run forward and take command of his company as it was without an officer.

On the 20th of August at the battle of Churubusco, Roberts attempted to enter into action with the regiment in the same manner, but I was fortunately near enough to him to capture him and send him to the rear, where Worth's division hospital was temporarily established, telling him that he was the only doctor we had and that he must not go under musketry fire.

I don't think I ever saw a doctor who enjoyed a fight more than he did, and with all of this pluck and go-ahead courage, he was as gentle as a woman, an attentive, intelligent physician and a kind hearted, good man.

Doctor Roberts had been two days before detailed for duty at the general hospital at Tacubaya, which was being organized by Asst. Surgeon Simpson, but he preferred duty with his regiment and obtained an order relieving him from hospital duty, and rejoined the fifth infantry but a few hours before the charge on the Molino. After he was wounded he was carried to Tacubaya and attended by Doctor Simpson, whose pen furnishes the following interesting account of his case:

The action commenced at daybreak, and about eight o'clock in the morning Asst. Surgeon Roberts was brought to my room in the Bishop's palace wounded in the head. He was struck by a musket or escopet ball on the temporal ridge of the frontal bone, about two inches above the left supra-orbital arch, the ball glanced, fractured and carried away a portion of the frontal bone, leaving the brain exposed; abscesses formed in the cavity of the cranium and he died in convulsions. Asst. Surgeon Roberts received his wound in the assault made by the fifth infantry on the Casa Mata, a stone work on the enemy's right. All the officers of one company having been shot down, he took command and was mortally wounded in the assault. From the Bishop's palace he was moved to Mixcoac, and from there to the house of the Minister of War in the city of Mexico, near Mineria, where he died October 13, 1847.

The final battles at Chapultepec and the gates of the city of Mexico occurred on the 13th of September, 1847. With the close of this year active operations on the part of the army of invasion terminated. The sick in the general hospitals were sent home as rapidly as possible; many of whom were sent to the large general hospitals at New Orleans which were under the charge of Surgeons Wright and Mills.

In 1848 the corps was again increased by the addition of ten assistant surgeons. The question of rank and prerogatives of medical officers was still a burning one, and decisions were constantly asked for; so much so indeed, that the attention of Congress was finally called to the matter and on the 18th of July, 1850, a resolution was passed by Congress requesting the President to communicate his views on the subject. A board consisting of several general staff officers, colonels of artillery and of infantry, Surgeon Thomas G. Mower,

and Paymaster David Hunter, was convened and presented a report with a draft of a bill, which so far as relates to the medical department reads as follows:

SECTION 5. And be it further enacted, That the rank conferred by section 8 of the act approved February 11, 1847, entitled 'an act to raise for a limited time, an additional military force, and for other purposes,' upon the officers of the Medical Department, * * * * shall entitle the officers holding such rank to choice of quarters and to precedence according to rank on courts, boards and councils, and to the military honors of that rank, and when they chance to be at a post or with a detachment commanded by a junior officer they shall not absent themselves from the post or detachment, without notifying the commanding officer, though of inferior rank, of their intention to do so.

In 1850 the corps first sent delegates to the American Medical Association.

In 1851 the uniform was again changed, and this time it was proposed to differentiate between medical officers and others by refusing to the former the sash prescribed for all others. This evoked a vigorous protest from Surgeon General Lawson, which resulted in the provision of a green sash for medical officers and which they continued to wear until the abolition of all sashes in 1872.

In the annual report of the Surgeon General for 1853 and following years, the necessity for increasing the number of medical officers was strongly urged upon Congress. Although the number of medical officers in proportion to the size of the army was large, yet the great number of new posts which were being established in the territories rendered it impossible to supply them with medical officers. Moreover, medical officers were needed to accompany detachments of troops on Indian expeditions, so that the demand was far in excess of the supply. On this subject, General Lawson wrote November 10, 1855—

The duty again devolves upon me to report that the numerical strength of the medical corps of the army is not sufficient to meet the requirements of the service. It may appear at a first glance that 94 medical officers should suffice for an

army of 19 regiments and corps of the line, with the necessary officers and men of the staff departments, the whole force numbering 17,861 men; but upon an examination into the matter, it will be found that the corps, with its present number, does not and cannot give the necessary medical aid to all the troops dispersed throughout our very widely extended territory.

The number of physicians does not depend upon the numerical force of the army, but upon the manner in which it is employed; that is, upon the divisions and sub-divisions it has to undergo, and the particular service in which it is engaged. One surgeon and two assistant surgeons will suffice for one regiment or corps of ten companies, or a thousand men; these three officers may also serve that corps divided into three battalions; but they cannot possibly render the necessary medical aid to the ten companies of the corps, each company occupying a separate post, the one 20 miles distant from the other.

Our army is spread all over the country, from the Atlantic to the Pacific oceans, occupying 89 military posts and arsenals, each station requiring one physician and some of them two. To supply medical officers to the military posts garrisoned by troops of the line, and furnish the necessary complement of physicians to serve with detachments of men constantly operating in the field, would exhaust the whole number of our regular corps, 94 in number, were they all efficient and present for duty; leaving us to supply medical aid to troops passing in transports or by land, from one section of the country to another; to the officers and men stationed in our large cities, on staff and other duties; to the many forts on the Atlantic not garrisoned, but held in charge by a few engineer and ordnance men; and to the various recruiting rendezvous, as best we can, under contract by the month, or by the day and the visit.

Officers of the medical department, however, get sick as well as other people; they are entitled to occasional relaxation from duty like other officers; and again they have a claim the same as officers of the line and other staff departments of the army, to the indulgence of a leave of absence from duty to visit their families and friends, and to attend to important private business.

With the aged and permanently disabled officers and the sick, together with those entitled to leaves of absence, our force of 94 surgeons and assistant surgeons may be considered as reduced on an average 8 or 10 per cent. or to 85 effective men for duty. At this time, however, there is but one medi-

cal officer on leave of absence; and this one has just returned from a 6 years' tour of service in the Department of the Pacific.

Within the last three years there has been paid out, on account of the employment of private physicians, \$72,520., averaging \$24,173 per annum; this last sum being about the amount of the annual pay of 24 assistant surgeons of the army. Now as we have to expend annually for extra medical attendance \$24,000 and more, or the sum of the pay and emoluments of 24 medical officers of the army, the question arises whether we shall pay out the money to private physicians, unknown to us and employed on the spur of the occasion, instead of regularly instructed and disciplined medical officers, who have been examined by competent persons and found qualified morally and physically, as well as professionally for the practice of physic and surgery in the army.

General Lawson also called the attention of Congress to the advisability of the enlistment of a certain number of competent persons to serve as hospital stewards and also the justice of paying men detailed for duty in hospital extra compensation. His peroration is worthy to be quoted in extenso:

In conclusion, I beg leave to say that the doctrine which seems now-a-days to obtain, viz: that nurses and physicians administering to the body, as well as the high personages of the church who administer to the soul of man, have to look for their reward in Heaven, for the good deeds done in this world, may be very consolatory, very satisfactory, and even very flattering to some of us of the craft, particularly as it brings us somewhat in juxtaposition with the pure members of the hierarchy. There are other persons, however, and among them soldiers of the army, faithfully laboring by day and by night as nurses in our hospitals, who cannot brook the idea of being placed beyond the pale of rightful consideration accorded to soldiers employed in making a bridge or cutting a road, and who cannot be brought to believe otherwise than that they might as well receive a portion if not their full measure of recompense on earth here below, and take their chance for higher and more permanent reward in another and a better world.

In due course of time the recommendations of the Surgeon General were enacted into law, and the corps was increased, hospital stewards were authorized, and extra duty pay was given to the men detailed in hospitals.

Each year there was a gain—always slow and sometimes imperceptible, but nevertheless a gain. The personnel of the medical department was so improved through the high standard demanded by the examining boards that the medical department of the army was quite on a plane with the best talent the country afforded. Each decade marked the departure of some giant of the corps, but the ranks were quickly closed, and the organization ever pressed forward.

At the outbreak of the War of Secession, the medical department was composed of one surgeon general with the rank of colonel, 30 surgeons with the rank of major, and 84 assistant surgeons of the rank of captain or first lieutenant. Very soon after the attack on Fort Sumter, and while troops were hurrying to the defense of the capital, the surgeon general, whose large experience and training would have rendered his services invaluable, was compelled to relinquish his office on account of failing health, which terminated in his death in May, 1861. The medical department of the army is under the greatest obligations to General Thomas Lawson. He had served for nearly 50 years. His vigorous intellect and industry were ever used in securing every right to his corps which the interests of the service demanded. He had an ardent love for the military profession and was indeed a typical medical officer. Surgeon Finley was appointed surgeon general May 15, 1861, and retired April 14, 1862.

The history of the medical corps at this critical period is most interesting and instructive, but time will not permit its consideration in detail. The magnitude of the struggle then being entered upon gradually but surely impressed itself upon the minds of the people. What at first seemed to be a question of but 75,000 men and 30 days, rapidly rose to millions of men and fifty times 30 days.

The medical corps of the permanent establishment was increased and reorganized. The logic of events was pointing out the place, function and responsibility of the medical department, and though all through that war, as in every other war, we had to contend strenuously for everything necessary

to our efficiency, yet as time rolled on these things were conceded, grudgingly indeed, but nevertheless conceded. One of the first things asked for, after we had provided a sufficient number of surgeons for the care of the actual sick and wounded, was the organization of a corps of medical inspectors whose duty, as the name of their office implies, was to look after and unify the work of the department. As early as 1862 the necessity for such a body of officers became pressing, and a bill was introduced by Mr. Wilson in February of that year, which finally became a law on the 16th April. Section 2 of this law provides that the medical inspector general shall have, under direction of the surgeon general, the supervision of all that relates to the sanitary condition of the army, whether in transports, quarters, or camp, and of the hygiene, police, discipline, and efficiency of field and general hospitals, under such regulations as may hereafter be established.

It seems remarkable that anybody could question the necessity for such inspection by a trained body of special inspectors, especially after the results obtained by them during our greatest war; but it is interesting to observe that in spite of this experience we passed through the Spanish-American war without such a corps, and every inspection that a chief surgeon made (and such were of necessity made every day), was in direct contravention of paragraph 1465, Army Regulations, 1895 (§ 1671. A.R. 1901).

Assistant Surgeon Wm. A. Hammond was appointed Surgeon General April 25, 1862. General hospitals were at this time placed under the direction of the surgeon general, but this was done grudgingly. During this year the surgeon general, addressed a letter to the Secretary of War requesting that medical directors of the army be given the same rank as chiefs of the quartermaster's and subsistence departments, who, under the provisions of the Act of August 5, 1861, were made colonels, which was returned with the following endorsement: Refused unless it can be shown that the skill and efficiency of surgeons are increased by an increase of rank and pay.

Upon the receipt of this endorsement, the surgeon general addressed the following letter to the Secretary of War:

SIR:—I have the honor to acknowledge the receipt of a copy of your endorsement on my application to have the temporary rank of colonel given to the medical directors of General McClellan's and General Halleck's armies. In that endorsement it is stated: "Refused unless it can be shown that the skill and efficiency of the surgeons are increased by an increase of rank and pay."

I cannot undertake to show this. I do not believe it to be true, that the skill and efficiency of surgeons would be increased by an increase of rank and pay—but if not surgeons, certainly not quartermasters and commissaries, or engineer officers. I think however and I am sure, sir, you will agree with me, that no men work more for less reward than the officers of the medical department.

My request was not however intended to refer to surgeons as such, but to the medical directors of large armies. The duties of medical directors are purely administrative, they are on the staff of the commanding general, and have control of all the medical officers, supplies and details.

Their duties are most onerous. For the proper performance of important duties it is a recognized principle in military affairs, that rank is essential. A medical director has only the rank of any other surgeon, that of major, and I truly believe that increased rank will enable him to perform his duties better by causing his wishes to be treated with greater respect by his commanding officer, and his commands obeyed more willingly by his subordinates. The application was made without the knowledge of either of the officers who would be benefitted by the request being granted.

Upon presenting the matter to General McClellan he assured me that it met with his cordial approval and he authorized me to say so to you.

Other staff officers whose duties are of no greater importance than those of the officers for whom I ask increased rank, and which are not of so purely a military character, have had this rank conferred upon them. It certainly does not appear just that the chiefs of the Adjutant Generals', Quartermaster's and Subsistence departments should receive greatly increased rank and the chief of the Medical Department be entirely overlooked.

I again therefore ask that the medical directors of General McClellan's and General Halleck's armies may be ap-

pointed aides-de-camp with the rank of colonel, and I beg leave to add to this request that the same rank be given to the medical director of General Pope's army. I assure you that no act would be received with greater satisfaction by the 3,000 medical officers of our army than this.

No action was taken on this application, and it was not until February, 1865, that medical directors were granted additional rank, which was then given them by Act of Congress.

In his annual report for 1862, the Surgeon General recommended—

The establishment of a permanent hospital and ambulance corps, composed of men specially enlisted for duty in the medical department, and properly officered, who shall be required to perform the duties of nurses in the hospitals, and to attend to the service of the ambulances in the field. By the establishment of this corps, several thousand soldiers, now detached as nurses, cooks, etc., would be returned to duty with their regiments and the expense now incurred by the necessary employment of contract nurses obviated. * * * The necessity of such a corps has been recognized in all European armies, and I am able to speak from personal observation of the great advantages to be derived from it.

He also recommended the establishment of—

An army medical school in which medical cadets and others seeking admission into the corps could receive such instruction as would better fit them for commissions and which they cannot obtain in the ordinary medical schools, is a great desideratum. Such an institution could be established in connection with any general hospital, with but little if any expense to the United States. A hospital of a more permanent character than any now in this city, is I think necessary, and will be required for years after the present rebellion has ceased. I therefore recommend that suitable buildings be purchased or erected for that purpose. If this is done, the medical school and museum will be important accessions to it.

He called the attention of the authorities to the fact that the medical department should be charged with the duty of building its hospitals, that it should have control of its transportation, that a laboratory should be established for the examination and manufacture of medical supplies, and that a library should be established for the Surgeon General's office. Certain it is that almost everything that the corps has gotten

since his day was recommended by this remarkable man, who having incurred the enmity of Secretary Stanton was dismissed the service August 18th, 1864, in disgrace, and only after many years was restored to his position on the army list. He was succeeded by Medical Inspector Joseph K. Barnes (Surgeon U.S.A.)

Besides the medical officers of the regular and volunteer staff, and the medical officers of regiments, there was a class designated as Acting Assistant Surgeons, who were private physicians, uncommissioned, serving under contract to do duty with the forces in the field or in general hospitals. This class was very large, and embraced in its number some of the most eminent surgeons and physicians of the country. The medical cadets were generally young men, students of medicine, who were assigned to duty in general hospitals as dressers and assistants.

The Medical Department was still further increased by a number of hospital stewards, who were enlisted as needed and who performed the duties of druggists, clerks, and store-keepers.

During the years of the war the organization of the regular staff had been increased so as to number one Surgeon-General, one Assistant Surgeon-General, one Medical Inspector-General, sixteen medical inspectors, and 170 surgeons and assistant-surgeons; there had been appointed 547 surgeons and assistant-surgeons of volunteers; there were mustered into service between April, 1861, and the close of the war 2109 regimental surgeons and 3882 regimental assistant-surgeons. During the same period there were employed 85 acting staff surgeons and 5532 acting assistant-surgeons.

To the fidelity and efficiency of this vast body of professional men, Surgeon-General Barnes, in his annual report of 1865, bears the following well deserved tribute:

I desire to bear testimony to the ability, courage, and zeal manifested throughout the war by the officers of the Medical Department, under all circumstances and upon all occasions. With hardly an exception, they have been actuated by the highest motives of national and professional pride.

and the number who have been killed or wounded bears honorable testimony to their devotion and duty on the field of battle.

The following record of casualties of the regular and volunteer staff during the war shows well for the honor of those who are erroneously supposed to escape the dangers and chances of war.

Thirty-two were killed in battle, or by guerillas or partisans, and nine by accidents; eighty-three were wounded in action, of whom ten died; four died in rebel prisons, seven of yellow fever, three of cholera, and 271 of other diseases, most of which were incidental to camp life or the result of exposure in the field.

Of the amount of labor performed by the medical staff during the war, some idea may be obtained when it is stated that 5,825,480 cases of wounds and diseases occurred among the white troops and 629,354 cases among the colored troops.

The cost of maintaining the Medical Department formed no small portion of the total expenses of the war, and it is a matter of just pride that it can be said that the medical disbursing officers performed their duties faithfully and honestly, and that the immense quantities of medical supplies distributed all over the country were almost without exception properly accounted for. The expenditures on behalf of the Medical Department to the close of each fiscal year, on the 30th of June, from 1861 to 1866, were as follows:

1861.....	\$ 194,126 77
1862.....	2,371,113 19
1863.....	11,594,650 35
1864.....	11,025,791 33
1865.....	19,328,499 23
1866.....	2,837,801 37

Making a total of \$47,351,928.24, expended during the war (exclusive of salaries of commissioned officers) for the benefit of the sick and wounded soldiers of the nation.

With the close of the war, so rich in dearly bought experience, the Medical Department, apparently content to embalm that experience between the covers of its great history, returned to the methods of ante-bellum days, and the Army

again became the advance guard of civilization upon our western frontier.

The history of the Medical Department since 1865 may be outlined as follows:

On July 28, 1866, the following Act of Congress became law:

The Medical Department of the Army shall consist of one surgeon-general, with the rank of brigadier-general; one assistant surgeon-general, with the rank of colonel of cavalry; one chief medical purveyor, and four assistant medical purveyors, with the rank of lieutenant-colonel of cavalry; sixty surgeons, with the rank of major of cavalry; one hundred and fifty assistant-surgeons, with the rank of lieutenant of cavalry for the first three years of service, and the rank of captain of cavalry after three years' service.

On March 3d, 1869, all promotion or appointment in the Medical Department (and other staff corps) was suspended, and thereafter till 1874 the Department simply marked time. Never since its reorganization had all its offices been filled; and in 1874, when examinations for appointment were reinstituted, there were nearly sixty vacancies.

By act of Congress approved June 23d, 1874, the Medical Department of the Army thereafter consisted of one surgeon-general with the rank, pay and emoluments of a brigadier-general; one assistant surgeon-general and one chief medical purveyor, each with the rank, pay and emoluments of a colonel; and two assistant medical purveyors with the rank, pay and emoluments of lieutenant-colonels; fifty surgeons, with the rank, pay and emoluments of majors; one hundred and fifty assistant-surgeons, with the rank, pay and emoluments of lieutenants of cavalry for the first five years' service, and with the rank, pay and emoluments of captains of cavalry after five years' service. And all original vacancies in the grade of assistant surgeons were to be filled by selection by competitive examination; and the Secretary of War was authorized to appoint, from the enlisted men of the Army, or cause to be enlisted, as many hospital stewards as the service might require, to be permanently attached to the Medical Department, under such regulations as he might prescribe.



The permanent attachment of hospital stewards to the Medical Department, reiterated in this law, was the germ of an organization, the Hospital Corps, which thereafter sprang into existence, and which is destined to radically change the methods that have for so many years obtained in our service—methods which were only temporarily changed to meet the exigencies of the most stupendous war the world has seen.

The Act of June 26th, 1876, declared that the number of assistant surgeons allowed by law should be reduced to one hundred and twenty-five; in addition to the grades then allowed by law, there should be four surgeons with the rank, pay and emoluments of colonels, and eight surgeons with the rank, pay and emoluments of lieutenant colonels, to be promoted by seniority from the medical officers of the Army.

July 3d, 1882, Col. Charles H. Crane was appointed Surgeon General; he was succeeded, November 23d, 1883, by Col. Robert Murray, who in turn was, on November 18th, 1886, succeeded by Lieut. Col. John Moore.

No further legislation affecting the Medical Department became law until March 1st, 1887, when the Act was passed organizing the Hospital Corps.

Loosely drawn and elastic as is this law, no Act of Congress since that of 1848—which for the first time recognized the military status of the medical officer—is more important to the present efficiency and future usefulness of the Medical Department. All the regulations governing this organization are of necessity based upon this law, and very well meet the current requirements of the various detachments scattered throughout the country; but such active-service experience as has been gained therewith has shown that a more closely knit military organization is necessary. This is directly in line with the experience of military medical officers in other armies, and there can be no question that a very much more detailed organization than now exists in the hospital corps will be necessary when we again find ourselves, as we surely will, in the midst of a war. Let us hope that we will not again have to organize under fire.

Col. J. H. Baxter was appointed Surgeon General August 16, 1890, and was succeeded by Col. Charles Sutherland, January 7, 1891.

The following Act of Congress was approved July 27th, 1892:

That, from and after the passage of this Act, the grade of certain medical officers of the Army below that of surgeon-general shall be as follows: Those holding the rank of colonel, assistant surgeon-generals; those holding the rank of lieutenant colonel, deputy surgeon-generals.

That before receiving the rank of captain of cavalry, assistant-surgeons shall be examined under the provisions of an Act approved October 1, 1892.

That medical officers of the Army may be assigned by the Secretary of War to such duties as the interests of the service may demand.

That all acts or parts of Acts inconsistent with the provisions of that Act are hereby repealed.

The third section of this Act as previously stated would appear to abrogate Section 1169 of the Revised Statutes, viz: "Officers of the Medical Department of the Army shall not be entitled, by virtue of their rank, to command in the line of the Army or in other staff corps;" and places the Medical Department in the same category with that of the staff corps, as set forth in paragraph 16, Army Regulations, 1889.

Lieut. Col. George M. Sternberg was appointed Surgeon General, May 30th, 1893.

From the foregoing it will be observed that there existed in the Medical Department of the United States Army at the close of this period, no detailed scheme of organization for active service. The war scheme promulgated by the law of 1864, which ceased to actively exist with the surrender of the Confederate forces, was abrogated by the peace scheme of 1887, which provides that "all necessary hospital services in garrison, camp or field (including ambulance service), shall be performed by the members of the Hospital Corps." Contrasted with the almost perfect sanitary organization of other armies, our then unpreparedness in this direction points a moral we can ill afford to ignore.

THE SANITARY SERVICE OF THE ENGLISH ARMY*

By JOHN STEWART KULP, M. D.,

ANGEL ISLAND, CALIFORNIA.

CAPTAIN MEDICAL DEPARTMENT, U. S. ARMY; MAJOR AND SURGEON OF UNITED STATES VOLUNTEERS.

THE many-headed medical departments of Great Britain consist of the Army Medical Staff, the Royal Army Medical Corps, the Militia Medical Staff Corps, the Militia Reserve Trained in Medical Duties, the Volunteer Medical Staff Corps, the Army Nursing Service, and "The medical establishments of the army generally". Fortunately for purposes of description their duties are practically parallel, and consist of the preparation of statistical returns for presentation to parliament, the supplying of medical stores to the army, the preparation of estimates for them, the care of the sick, the command of military hospitals in peace and war, and the duty of advising in matters (relating to barracks, camps, garrisons, stations, hospitals, transports, diet, dress, drills, and duties), which may conduce to the preservation of health.

The orders relating to the sanitary service are explicit in their detail, are contained in no less than eight books, and while necessarily quite cumbersome still are admirable in that they outline in full the duties of each position to which a medical officer may be called.

ORGANIZATION.

PERSONNEL.—The entire service is now undergoing a reorganization, but there is little likelihood of radical structural changes being made, though it is to be hoped that this great staff department soon will be placed on an equality with others of importance. At present it is beneath every department, including the chaplains. Supervis-

*A special report made to the Surgeon General of the Army.

ing the whole is a Director General (major general) who is assisted in the work of his office by a Deputy Director, an Assistant Director, and two Deputy Assistant Directors bearing rank of Major General, Lieutenant Colonel, and Majors respectively. Exclusive of these there are (June, 1901:

1. Royal Army Medical Staff — 9 Surgeon Generals ranking as Major Generals.
2. Royal Army Medical Corps — 27 Colonels.
180 Lieutenant Colonels.
314 Majors.
214 Captains.
230 Lieutenants,
75 Quartermasters.
3. Indian Medical Service — 5 Major Generals,
16 Colonels,
158 Lieutenant Colonels,
154 Majors,
240 Captains,
131 Lieutenants.
4. Militia Medical Staff Corps — 1 Lieutenant Colonel,
1 Surgeon Major,
8 Surgeon Captains,
8 Surgeon Lieutenants,
1 Quartermaster.
5. Volunteer Medical Staff Corps — 3 Surgeon-Lieutenant-Colonels,
4 Surgeon-Majors,
33 Surgeon-Captains,
25 Surgeon-Lieutenants,
2 Adjutants,
16 Quartermasters,
1 Chaplain.
6. Army Nursing Service — 1 "Lady" Superintendent,
19 Superintendents,
67 "Sisters".

Beneath these are the warrant officers (consisting of 86 Sergeant Majors), 1st and 2nd class Staff Sergeants, non-commissioned officers (Sergeants, Corporals, and Lance Corporals), and a variable number of first, second, and third class privates. All vacancies in the grade of quartermaster are filled by the promotion of warrant officers.

Apparently the standing of the female personnel is higher than with us, the nurses are allowed servants, and are on terms of social equality with the families of officers. Marriage with enlisted men is unknown, and the disturbing element of sex is less prominent than usual. There is a difference of opinion among medical officers as to their utility, those with

whom I conversed being about equally divided on the subject, but there is no division of opinion among the warrant and

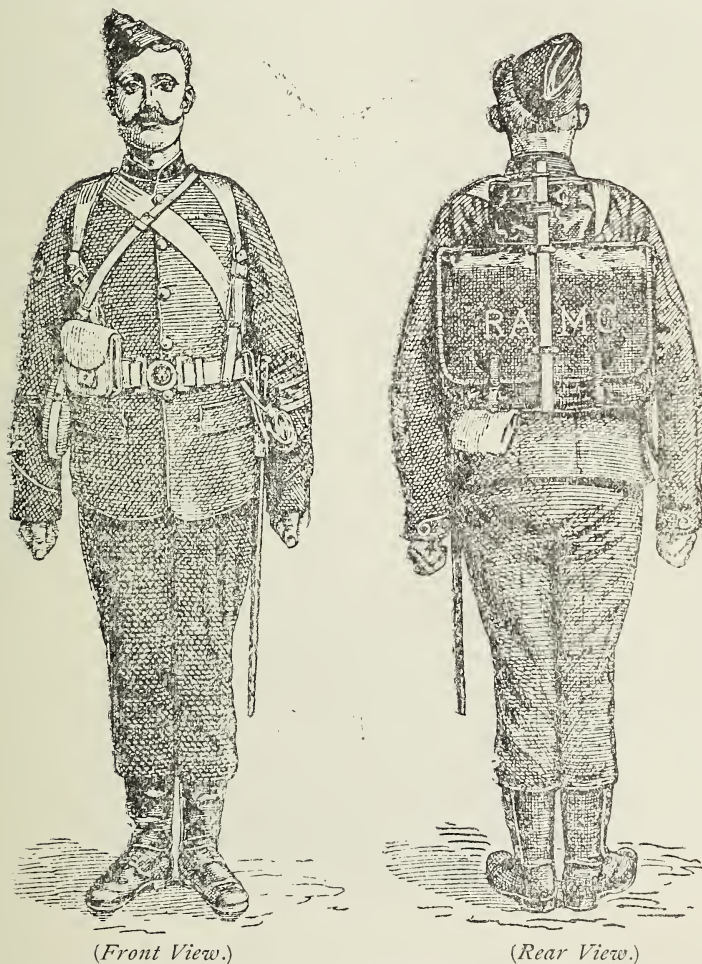


Fig. 1. Private of the Royal Army Medical Corps in Marching Order.

Belts are pipe-clayed in peace and rubbed with mud so as to resemble khaki in war non-commissioned officers, who are unanimous in their condemnation of this feature of the military service, for reasons not without reasonable foundation.

FIELD SERVICE.—In time of war there are in each separate army a Principal Medical Officer of the Force, who in addition to other specified duties "will under the General Officer Commanding, have supreme control of, and be responsible for, all medical arrangements and establishments,"* and a Principal Medical Officer on Lines of Communication who, under the Inspector General, has control of all hospital establishments on lines of communication and at the base (including hospital ships). The Chief Surgeon of a division is charged with more authority over matters relating to the health of troops than with us, and camps, sites, buildings, and villages must be inspected by him (or by one of his staff) before being occupied by troops.

To each staff or regimental unit a medical officer is attached to afford temporary assistance in camp, march, or action. Though under the orders of the commanding officer, he receives instructions from, and is under the control of the division surgeon. He is furnished a servant from the command, a lance corporal, and a private—the latter acting as orderly. Before an action two trained men report to him from each company, without their arms, and none of this personnel loses touch with their unit, or are allowed to carry back wounded.

INSTRUCTION OF OFFICERS.—The approved candidate for a commission enters the army medical school at Netley as a surgeon on probation, and after a course of from four to five months on the specialty of military medicine, is commissioned on passing a satisfactory examination. Medical officers, cadets, and officers of Royal Engineers, and line officers are also allowed to attend courses.

The school is an independent command under the Secretary for War, and is governed by its own senate, which consists of the Director General of the Army Medical Service, the Commanding Officer of the Royal Victoria Hospital at Netley, and the four professors. The subjects of the course are under the direction of the professors occupying the chairs of hygiene,

*Regulations Army Medical Services, 1900, Pg. 627.

clinical and military medicine, clinical and military surgery, and pathology.

The course on hygiene is both practical and theoretical, is admirable in its thorough comprehensiveness, and includes a broad general view of the subject, its history, its civil and military objects, and the geographical distribution of disease.



Fig. 2. Sergeant Major Royal Army Medical Corps.

Care is taken to impress on the student that the highest function of the military surgeon is the prevention of disease. Space does not permit of a complete outline of the course, the principal theoretical divisions of which are soil, water, sewerage, air, habitations, food, exercise, clothing, equipment, disinfectants, disposal of the dead, military service, (at home and

abroad) climate, and comparisons between civil and military statistics.

The practical instruction includes various analyses of water, air and food.

In clinical and military medicine there is bedside instruction on the more prevalent diseases of military men, together with lectures on the diseases which are modified by the habits, character and duties of the soldier, invaliding and tropical diseases. Emphasis is laid on the physical geography



Fig. 3. Royal Army Medical Corps Officers' Mess at Netley.

and climate of the various colonies, as well as on such diseases to which the British recruit is peculiarly prone. But little attention seemed to be paid to venereal disease notwithstanding the extreme prevalence of such affections in the English service. Lunacy is considered of sufficient importance to have six lectures devoted to it.

The course on military surgery consists of sixteen lectures and demonstrations covering the mechanics of projectiles, gunshot wounds, wind contusions, first aid, bearer com-

panies, military hospitals, and property depots. The assistant professor on this subject also gives practical demonstrations on eye surgery, refraction, and the X-ray apparatus.

Practical laboratory work in pathology is carried on throughout the course and the sixteen lectures deal princi-



Fig. 4. Officer Royal Army Medical Corps (fatigue uniform).*

pally with the pathological conditions which are common among soldiers.

Such candidates as pass satisfactorily are commissioned and sent to Aldershot for their technical military training. The instruction is largely practical in connection with the training of the recruit battalion of the Royal Army Medical

*Lt. Col. Charlton, R.A.M.C., commanding at Netley.

Corps and includes the drill, interior economy and discipline of the medical service. The drills are: foot and mounted, railway, wagôn, saddle and cacolet, ambulance, setting up, and litter. Officers are at first drilled separately in awkward squads, and in these carry walking sticks instead of swords. Mounted officers wear spurs with all uniforms.

Features of the education of the the young officer are various "messes" (corresponding to our clubs), which every officer



Fig. 5. West Wing of Royal Victoria Hospital, at Netley taken from the central point.

is required to join. The special mess uniform which is required resembles as a rule that of a drum major, and each mess has traditions and customs peculiar to it. In some regimental messes (King's Royal Rifles, 60th, for example), no insignia of rank is worn, but nevertheless the mess dinner is a military function, and the mess itself a military organization where proper respect for superiors is required. The *esprit de corps* is shown by the many remembrances sent back by officers serving in distant colonies, and the social strength which the

medical department has shown during the recent reorganization is largely due to this factor.

INSTRUCTION OF ENLISTED MEN.—The English recruits seem to me to compare unfavorably with our own, and also to those of Canada, Australia, Ceylon, and Tasmania. This is largely due to poor pay, that of a private being about twenty-eight cents a day, with stoppages of seven cents for mess, two cents for laundry, and fourteen cents when sick in hospital. This places the man in a condition of abject pov-



Fig. 6. Closed Hospital Marquee (smaller than regulation pattern.)

erty. The undersized, underfed, and undeveloped boys one sees in the English ranks, or invalided from South Africa, are not at all representative of the sturdy English race. Our own recruits, even among our volunteers, are mentally as well as physically superior to them, and our instruction very properly begins at a more advanced point.

The military training commences with squad and company drill, including the principles of working in extended order, a modified course of musketry instruction, and sword

and carbine-sword-bayonet exercises. As is usual in other European services the sanitary soldiers carry proper side arms. The recruit then progresses to litter drill, hand-seat drill, use of country carts, general service wagons, railway cars (Zavodovski's method), pack saddles and cacolets. The field training proper consists of bearer company practice, field hospital encampments, tent pitching, ceremonies, and semaphore signalling.

The technical teaching occupies about ten weeks, and



Fig. 7. Hospital Marquee. One side Open.

covers practically the same ground as does that of our own service. The principal training school is at Aldershot, where there is a battalion of the Royal Army Medical Corps consisting of a commanding officer, a second in command, an adjutant, a quartermaster, and four companies. The daily routine is

6.30— 7.30 Drill,
9.00—10.00 Lecture,
10.00—11.00 Drill,
11.00—12.00 Examination,
2.00— 3.00 Demonstration in First Aid.

The lectures cover elementary anatomy, physiology, fractures and dislocations, wounds and dressings, antiseptics, first aid, emergencies, hemorrhage, medicines, baths, instruments, poisons, ward management, and observation of symptoms. There is also didactic instruction on such subjects as tent pitching, field kitchens, latrines, camping, and the work of field hospitals.

The squads at Aldershot were sharp and smart in their drill, and although their litter was heavy and of a poor design, they handled it very well. The men wore knee-caps to protect their clothing, their issue shoe is shod with iron, and the wearing of side arms improves the appearance of the detachment. Both officers and men compare advantageously with those of other branches of their service, and the many advantages of a central school are self-evident.

SUPPLIES AND EQUIPMENT.

TENTAGE.—According to the Field Service Manual, tents (with the exception of those used for operating) are not considered necessary under normal conditions. The *circular forms* are made of medium duck with six inch eaves, and three bib ventilators. The more common form is 13 feet in diameter, has 26 inch walls, is $9\frac{3}{4}$ feet high, and weighs without its poles and pins $41\frac{1}{2}$ lbs. This tent accommodates fifteen (!) soldiers, or four patients. Another popular form has a diameter six inches greater and weighs three pounds more.

The "Hospital Marquee" (Figs. 6 and 7), resembles the marquee in use during the civil war, is an excellent tent and in my opinion is superior to any in our service. It covers an ellipse 50 x 31 feet, has double roofs and walls, and a waterproof carpet. It is a strong and serviceable tent which when rolled in its canvas cover with pegs, poles, mauls, and ropes weighs 512 pounds. It will accommodate about 40 patients or 90 men (using our allowance of 35 square feet.) Their "operating tent" resembles our hospital tent except that it is 20 x 14 x $9\frac{1}{3}$ feet, with walls but three feet high. It compares unfavorably with either the Munson or the old pattern hospital tent.

The "Tortoise Field Hospital" (Fig. 8), is an ambulance

wagon with a large elliptical tent packed upon it so as to leave the interior of the vehicle available for a stove, stores, and two open litters. To pitch it it is only necessary to unroll the tent from the sides of the wagon, the top of which then becomes its central support. The tent thus formed is large, comfortable and serviceable, having a capacity of twelve beds. The stove not only heats the tent but can cook for the sick as well while en route, and the wagon can be withdrawn from the tent after it is once pitched, if needed for other purposes.



Fig. 8. Tortoise Field Hospital.

These tents are in use in several foreign services, and it is recommended that one be procured for experimental purposes.

The instruments, furniture (which is not the property of the medical department), and medical supplies are not superior to those in our own service either in their quality or their arrangements for transportation. The blank forms in use are cumbersome and antiquated, the card system is unknown except in a rudimentary form and clerical work is not conducted according to modern methods.

The principal hospitals visited were Paddington at Sydney, Australia, (64 beds), Adelaide Hospital, a civil institution but receiving soldiers and sailors (320), Columbo Station Hospital (60) Ceylon, Cambridge Hospital (720) at Aldershot, and the Royal Victoria at Netley (2800). Of these the army hospitals proper were clean and well administered, the personnel was well disciplined and soldierly in appearance, and the buildings though old were well adapted to their purpose. The number of officers allowed is greater than with us and they



Fig. 8. An English Army Canteen.

are of higher rank. For instance the Columbo Station Hospital of 60 beds had a lieutenant colonel, a major and two captains assigned to it but on the afternoon of my visit, although it was fairly well filled, there was no officer there and a very intelligent warrant officer had been left in command.

The professional service is well performed, and there is a systematic and business-like way of providing every possible care and comfort for the sick soldier. Nearly all the larger hospitals have their standing orders printed and the duties of each man are outlined in detail. Much friction always exists

between warrant and non-commissioned officers and the female nurses, and in my opinion the latter are a detriment to their service, the possible exception being in the large base hospitals.

On entering an English institution the patient gives up all clothing, and receives a hospital suit which he wears until he leaves. If he be a non-commissioned officer, proper chevrons are issued to him at the same time. At a non-dieted



Fig. 9. Huts of the German pattern used at Netley.

hospital his rations are furnished by his organization, but in most hospitals our own system prevails. There is a lack of modern plumbing, and the usual systems of heating and lighting are not what one would expect in so progressive a country. On the other hand the buildings are kept in excellent repair, and Calley's system of painting gives a durable, clean and economical finish. Most of the wards are painted a duck-egg green, seven thin coats being applied.

Whenever a hospital becomes crowded beyond its capacity

it may expand into huts of the German pattern, and at Netley as many as a hundred of these have been filled (Fig. 9). These larger hospitals are very complete and autonomous, Netley having its own railroad connecting it with the Southampton docks, and the general system of the country. The train consists of five coaches having a capacity of seventy recumbent patients, and the carriages are lightly and strongly made. The whole is a model of comfort and convenience, and is in charge of a corporal and five privates. A special detrain- ing squad under a sergeant is detailed when necessary, and the home station is so arranged that patients can be admitted directly into the hospital. The Royal Victoria also has its own conservatory, swimming baths, fire department, museum and chapel. Officers as well as men are forced to attend churches.

The size of this institution can be better understood when it is remarked that over a thousand patients have passed through in a week, and that the main corridor is six hundred yards long.

TRANSPORTATION.—Three forms of ambulance wagons are used. The first is a four-wheeled covered vehicle, weighing empty 1773 pounds, and is designed for two large animals. It accommodates six wounded (two recumbent, and four sitting at their heads and feet) and the litters are provided with pillows. Special features are the forage locker (three bushels) under the floor, a nine-and-a-half gallon water tank, loops for rifles, and lockers for wine and sundries. It carries four litters.

The second form has larger front wheels (45 in.), the whiffletree has springs to overcome the jar of starting, and the weight is 1839 pounds. This wagon is able to turn in a thirty-one foot circle. The other ambulance has but two wheels (56 in.), and weighs but 919 pounds. It carries two recumbent or four sitting patients, has platform springs below the axle, spiral springs at the whiffletree, and a canvas cover. The water tank has a hose and "mouthpiece" attached, there is a medicine locker, two slings for rifles, and red and white side

lights. The cart is strong, well built, is said to be comfortable, and can follow troops almost anywhere. It is believed that a few of these carts could be used advantageously in places where our own ambulance could not follow.

Another cart, on which is mounted a strong iron water



Fig. 10. Water Cart.

tank (Fig. 10), carries 108 gallons and weighs loaded 1890 pounds.

Neither of the four-wheeled ambulances compares favorably with our own, and the baggage wagons are heavy (2112 lbs.) and roughly finished. There is however an excellent twenty-five horse power steam wagon which, although but

slightly larger than the army wagon, carries a load of five tons, and draws an equal amount at the same time. It is made by the Thornycroft Company, has a speed of five miles an hour, and uses five pounds of fuel per mile. It is apparently an efficient and reliable means of transportation.

FIELD SERVICE.

Without preparation for self-sustaining service in campaign a medical department is useless for war. It must be able not only to take care of itself, but also to furn-

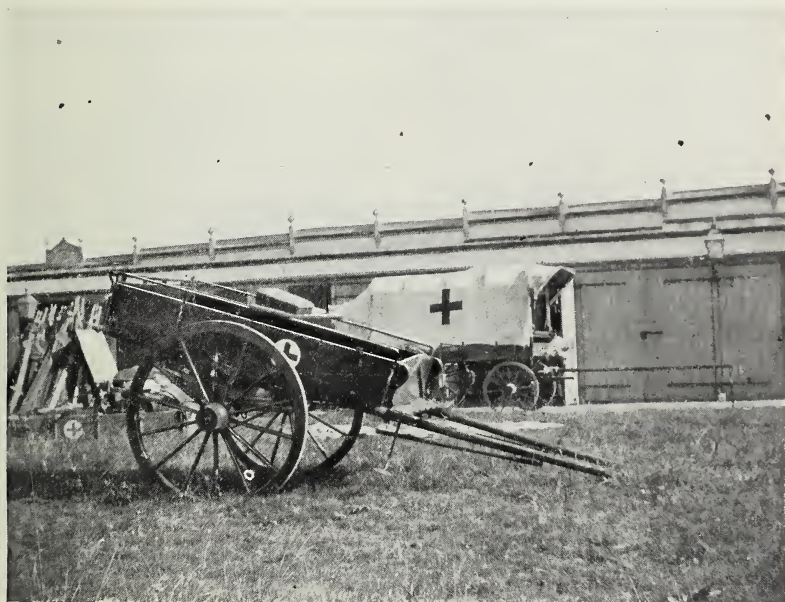


Fig. 11. Regimental Maltese Cart.

ish the knowledge of soil, water, and habitation without which an army inevitably becomes diseased. The English seem to realize this and divide their department into field service units comprising regimental detachments, bearer companies, field hospitals, hospital trains, hospital ships, staff units, and supply depots. The regimental detachment consists of a medical officer with assistants, a lance corporal, a private as driver of the regimental cart, (Fig. 11), a servant,

and the two bearers from each company. The equipment consists of a medical companion, water bottle, and field medical panniers. The company bearers leave their arms on the cart when an action is expected, all enlisted men in this detachment being taken from the regiment. The defects of such a system are obvious.

The bearer companies are composed of details from the Royal Army Medical Corps and the Army Service Corps, and consist of 1 major, 1 captain, 1 lieutenant, 2 warrant officers,



Fig. 12. Chair used for carrying patients on stairs.

7 sergeants, 8 corporals, 1 bugler, 31 drivers, 44 privates, 56 horses, 4 carts, 1 water cart, and 10 ambulance wagons. Of the carts, the first carries four litters, operating tent, operating table, surgical dressings, and instruments. The weight of this cart and its load is two tons. The second supply cart has cooking utensils, sundry repair materials, lamps and oil, tools, flags, four litters, charcoal filter, and linen. It weighs when loaded 1825 pounds. The third cart

is for baggage, the commanding officer being allowed fifty pounds, the other two officers seventy, and non-commissioned officers ten each. It also carries blankets, horse blankets, 158 pounds of soap, rations, shoes and shoemakers' tools, 94 pounds of horse shoes, and weighs loaded 1800 pounds. The other cart carries food supplies, camp cooking utensils, and forage and weighs 2220 pounds.

The field hospitals are of one hundred beds each, and are supposed to be divisible.

Their personnel and equipment are as follows: 1 lieutenant colonel, 1 major, 1 captain, 1 lieutenant, 1 quartermaster, 2 warrant officers, 8 sergeants, 6 corporals, 17 drivers, 23 privates, 28 horses, and 6 vehicles. Of the latter one carries medical and surgical supplies, stationery, filters, cooking utensils, tools, 4 litters, camp and operating table, operating tent, extra wheel, and forage. The weight is $2\frac{1}{2}$ tons. In another wagon are much the same stores, while each of the two baggage wagons carries officers' and non-commissioned officers' luggage, bed linen and blankets, flags, tools, camp stove and so forth. These wagons weigh when loaded about two tons each, but the wagons themselves are so heavy that they apparently do not carry their own weight in load. Each field hospital has also the supply and water carts above described. On the march they follow the bearer companies. In my opinion the field hospital is too small and is over officered.

The hospital trains are composed either of cars regularly fitted for this purpose, or ordinary passenger coaches, or freight cars adapted to this use according to the method of

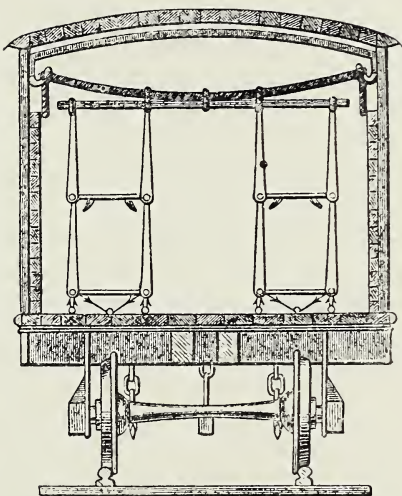


Fig. 13. Zavodovski's method of improving hospital cars.

Zavodovski. (Fig. 13.) The regulation train carries 132 recumbent sick, including 4 officers, and is manned by 1 field officer, 2 company officers, 2 sergeants, 4 corporals, and 20 privates all of the Royal Army Medical Corps. Their duties are commanding officer, care of the sick and wounded (these two officers being replaceable by civilian surgeons), ward master, pharmacist, 2 assistant ward masters, property man, 3 cooks, 16 ward nurses, and 2 on general police.



Fig. 14. Field Hospital at Melbourne, Victoria, Australia.

The supply depots are those of the base and those of the lines of communication. Cases containing medical supplies and the material used for their transportation are marked with the red cross and under the regulations cannot be diverted from the medical service without the *direct* order of the commanding general, and then only in cases of special emergency, when the Geneva cross must be removed. The allowance of personnel for the base depots is 1 officer, 2 non-commissioned officers, and 6 privates. A horse is also allowed.

Manifestly these depots are dependant on civilian labor, carpenters being provided when they are available. The ones on the lines of communication nearer the front are allowed but three privates.

The hospital ships theoretically carry 200 sick each, including 20 officers, and are not under the command of the medical department. Those in charge of the sick and the police of a ship are 3 field officers, 2 company officers (who may be replaced by contract surgeons), quartermaster, warrant officer, 5 sergeants, 5 corporals, and 29 privates. In addition there may be specially detailed 6 stewards, 1 stewardess, dhobies, lascars, and punkah men as are required for, and 4 nursing "sisters".

COLONIAL SERVICE.

Of the colonies, New South Wales possesses a "partially paid" medical department fully up to the standard of that of the home country, and organized on the same lines. The officers are men of more than ordinary aptitude, unhampered by obsolete methods. Possessing an active and strenuous personnel, and a liberally disposed government, the development of the medical service of the forces of the new Federation should prove of great interest. The Indian Service is so closely allied to that of England (so far as its organization is concerned) that there is much similarity between them, while the Canadian militia has about the same system as our own.

REMARKS.

South Africa has taught England what it is hoped we have learned during our late war, namely the value of an organized medical department possessing real authority in relation to all subjects affecting the health of troops. An aggregation of regimental medical services is not a medical department, and uniformity of material and administrative methods is of no greater importance, than is uniformity in the education of the personnel which is to handle them. The English are alive to the vital importance of the necessity for specialized training for their sanitary soldiers (commissioned as well as enlisted) and several officers expressed regret at a

defect in their system, which seems to exist in our own as well, due to the lack of inducements for reenlistment.

Four months of technical training costs 11 per cent of an enlistment. The pay of our hospital corps private for four months is \$111.00* and this time is not only gained by a reenlistment, but the man's added experience lends ever greater value to his services. It would seem that a substantial addition to our present reenlistment pay might be made.

The "better type of medical officer"† is conspicuous in the British service and there is every prospect that the rapid improvement which they recently have made will be continued. The Royal Army Medical Corps is now on a strong military footing, its discipline is good, and it is attracting a better class of men than ever before, while the warrant and non-commissioned officers are zealous and ambitious. The designation of our non-commissioned officers as stewards and acting stewards seems to rather justly furnish some ground for amusement, and their lack of side arms was a constant subject of remark.

In closing this report I desire to express my gratitude for the official and personal courtesy with which I was everywhere received.



*\$18 per month pay proper, clothing 12½ cents per day, ration 20 cents.

†Woodhull.

NOTE—Similar reports by Captain Kulp on the German and French Services are embodied in the report of the Surgeon General of the Army for 1901.

EMERGENCY HERNIOTOMY AND ENTERECTOMY,
WITH SECONDARY ENTEROSTOMY AND OC-
CLUSION OF A PORTION OF THE ILIUM.*

By JOHN M. HEWITT, M. D.,

FORT GIBBON, ALASKA.

CONTRACT SURGEON IN THE UNITED STATES ARMY.

A CIVILIAN employee of the army, James K. Galbreath, aged 45, a native of the United States, with previous good health,—although he had undergone the hardships incidental to prospecting in Alaska for twenty-five years,—had been affected with a small right femoral hernia for about a year during the last two months of which it seems to have been irreducible, but it gave him no annoyance.

This man accompanied a detachment which started from Fort Gibbon over the ice, on March 31st, 1901, for a point about one hundred miles below for the construction of the government telegraph line. He pushed a heavily loaded sled during this trip, which lasted sixteen days and was a hard one owing to stormy weather and a heavy trail. This was followed by another trip of fifteen miles, upon his return from which on the evening of April 28th, he complained of cramps. The usual medicines were prescribed and as he was reported to be no better upon the following morning, an examination was made and a right femoral hernia, about the size of a hen's egg, was discovered. The symptoms were moderately severe paroxysms of abdominal pain, slight vomiting and constipation. The pulse and temperature were normal.

Careful taxis, and the application of collodion, and a high enema with a colon tube, were tried, without result. Taxis, under complete chloroform anesthesia, failed also, and his condition being fully explained to him an operation was

*Special report to the Surgeon General of the Army.

urged, but he refused it. The character of his pains increased in severity and frequency until the fifth day when he was vomiting freely, although the ejecta were not fecal.

There had been no bowel movement, nor passage of flatus, the abdomen was only moderately distended, his pulse and temperature remained practically normal, and altogether his general condition did not appear alarming. Operation had been constantly urged from the second day and was only accepted by the patient, after much persuasion, upon the fifth day. A room in the Signal Station at Kockrine, Alaska, the camp then occupied by the detachment, was hastily prepared for the operation. The chloroform was administered by a Private of the Hospital Corps and the assistants were a Sergeant and two Privates. The following account is copied from my May report of this case.

"Under chloroform anesthesia, an incision was made and the tumor exposed. Upon opening the sac, about 15 c. c. of dark brown fluid escaped. The hernial constituents were, about three inches of small intestine, probably ileum, and some omentum, the intestine being very black in color and evidently gangrenous. The constricting ring was incised with considerable difficulty, as the sac was everywhere adherent, especially at the neck, where twisting of the hernial body on its axis, had matted the structures together. The intestine was freed and the sac had to be removed piecemeal, down to the neck, where, owing to the anatomical difficulties existant in femoral hernia in this situation, the presence of firm adhesions, the occurrence of troublesome hemorrhage and the lack of skilled assistance, it was found impossible to free it from the surrounding tissues. Not having a Murphy button, a primary resection was deemed inadvisable, so, the intestinal loop was brought up into the wound, stitched there, and treated with hot aseptic gauze pads. The gut reacted fairly well, but it was found necessary to resect about one inch of it, together with a small piece of omentum, four days afterwards; thus establishing an artificial anus. Recovery has been rapid and uneventful, the highest temperature having

been 100°F. on the second day after the operation. An anastomosis with the Murphy button, will be attempted later."

There is hardly any question that an operation performed as early as the third day, would have disclosed gangrene necessitating resection, but the patient positively refused consent until the fifth day and then only yielded to pressure amounting almost to force.

Upon the opening of navigation the patient was transferred to the Post Hospital at Fort Gibbon, Alaska, and upon July 27th with the assistance of Captain S. T. Weirick, Assistant Surgeon U.S.V., I performed an end-to-end anastomosis with a Murphy button, occluding a portion of the ileum.

Under chloroform anesthesia, ether being substituted afterwards, the usual curvilinear incision for exposure of the cecum and appendix, was made above Poupart's ligament. The vermiform appendix was at once encountered but, being innocent, was not molested. As anticipated, the incarcerated ileum, above the ileo-cecal valve, was found solidly welded together with omentum and portions of the sac which it had been found impossible to remove at the first operation; so that, to have dissected free the resected ends and to bring them within the abdominal cavity for anastomosis, would have been an extremely difficult thing to do, not to mention the danger of the introduction of infection from the artificial anus, which although carefully prepared and ligated, was still probably septic.

The expedient of making another resection within the abdominal cavity close up to the crural opening, and bringing the freshly resected ends together, thereby occluding the amputated, or original hernial portion of the ileum with its mesentery attached, and leaving it permanently imprisoned within the crural canal forming in time a fibrous plug and effecting a radical cure of the hernia, suggested itself. A pair of McLaren clamps and two others made of gauze having been applied, the resection was made, the incisions being carried well down into the mesentery for greater freedom in affecting the anastomosis. The resected ends of the occluded bowel

stumps were cleansed of fecal matter and fresh hydrogen peroxide 10 v. was applied and the serous surfaces being turned inward, they were closed completely with silk sutures. The ends designed for the anastomosis were then brought out of the abdominal wound, and it was found that considerable narrowing of the distal end and some thickening of its mucosa had taken place, so that the ordinary small intestine Murphy button could not be inserted, consequently, the No. 2 button, commonly used in cholecystenterostomy, was employed.

The silk used for puckering strings broke repeatedly, necessitating much delay in sterilizing more and in freshening up the bowel ends. There was considerable ectropion of the mucous coat of the distal end, which prevented snug coaptation of the shoulders of the button, and even after clipping this away, a few auxiliary sero-serous sutures of chromatised gut had to be inserted.

The anastomosis having been made, the bowel was replaced within the abdominal cavity, and the free incisions which had been carried down into the mesentery were not closed sufficiently to cause a too close coaptation of the stumps to the anastomosis. The abdominal cavity was then flushed out with hot normal saline solution, about a quart being left in, and the incision was closed with two rows of silk sutures, one for the peritoneum and one for the rest, a small wick drain being inserted, as infection was feared. Owing to having to send at a distance for the Murphy button and to a series of accidents, necessitating fresh sterilization, which was done at a distance, the patient was on the table about five hours. However, he reacted quickly, suffered little shock, and sustained no post-operative intestinal paresis, a fact remarkable for the length of time the abdominal cavity remained open and the amount of handling to which the bowels were subjected. He recovered without incident, having two fecal movements on the second day and one on the third day. The wick drain was removed on the fifth day and a small stitch abscess gave little trouble. The highest temperature was 100 +5° F.

I returned to my detachment on the tenth day after the operation and Dr. Weirick in whose care he remained, informed me that the patient passed the button on the morning of the eighteenth day after which date he steadily improved. The bowel ends at the sight of the artificial anus were to be dissected out for a short distance below the skin in order to allow the fistulous opening to close with a few sutures.

I am not aware that this procedure, of occluding and leaving the bowel stumps in the hernial canal permanently, is frequently resorted to, or if it is done at all. The reference at hand is meager, but I find that Helferich, of Greifswald, a few years ago, recommended in operations for strangulated hernia, when gangrene was found, that, the abdominal cavity be opened immediately and a resection and an anastomosis be made inside, the occluded gut to be dissected out of the hernial canal however, subsequently.

A theoretical objection to the expedient of leaving the stumps in permanently, would seem to be the possible production after convalescence, of an angularity and consequent obstruction of the restored bowel, anchored, as it is, by means of the mesentery, to to the occluded portion.

Fort Gibbon, Alaska, Sept. 17, 1901.



MULTIPLE SHOT WOUNDS OF THE HAND AND FOREARM.

By F. W. F. WIEBER, M. D.

ANNAPOLIS, MARYLAND.

SURGEON (LIEUTENANT) IN THE UNITED STATES NAVY.

ABOUT 10 years ago, Mr. S., while on a hunting trip with a companion, was shot, by the accidental discharge of both barrels of a shot-gun, loaded with No. 8 bird shot, in the hands of his companion, from a distance of about 6 feet. The contents of one barrel passed into the upper and outer portion of the left thigh about on a level with and a little to the inner side of the greater trochanter and passed out on a level and slightly behind it. The other barrel was discharged into the back of the left hand. The shots were scattered into the tissues from the metacarpus to near the elbow. Many shots can be felt without any trouble, under the skin, by the examining finger. The wounds caused by this accident were healed and the patient was able to attend to his business about three months after the accident.

With the exception of some weakness of muscles and in the absence of sensory symptoms, excepting occasional twinges and pains at changes in the weather, the man is not inconvenienced by the presence of these foreign bodies in his hand and forearm. Since the healing took place, several of the shots have come so near the surface, that they were easily removed by small incisions.

The skiagraph was taken at the physical laboratory of the Naval Academy by Professor Terry, by whose permission this copy is used.

The case is presented rather as a curiosity, than as one involving much practical significance from a surgeon's standpoint.



Skiagraph in case of Multiple Shot Wounds of Hand and Forearm.

THE MILITIA MEDICAL OFFICER AND HIS PAPERS*

BY MAJOR CHARLES C. FOSTER,

CAMBRIDGE, MASS.,

SURGEON OF THE FIFTH REGIMENT INFANTRY, M.V.M.

THE first thought of the volunteer medical officer is apt to be, why should he be bothered with all these papers? He thinks them an unmitigated nuisance, and is sure that nine-tenths of them are wholly unnecessary, or worse, for they take up time that might better be spent on his work. In his own practice he needs but little paper work, and fails to see why so much should be required of him now. The difference can be told in one word,—responsibility.

His own practice is his own affair. When he has done his duty by his patient, other details, such as collecting his bill, concern him alone. His medicines, dressings, instruments, and other equipment are his own property, to be procured, used, wasted or lost, as he sees fit. He can undertake or decline any case that comes to him, and is responsible only to his own conscience and the law.

When he enters the service, all this is changed. He becomes simply an agent of the government, given certain powers, held strictly accountable for every action and for every article of property put into his care, and required to keep the heads of his department constantly informed as to all medical events in the command to which he is attached. To fulfill these duties, a regular system of reports is necessary; and, for the sake of uniformity, accuracy and labor saving, a special blank form has been devised for each ordinary occasion, these constituting our papers.

Now, what particular system of papers shall we use? Obviously the same that we shall have to use in active service.

*Read before the Massachusetts Volunteer Militia School for Medical Officers, Boston, Mass., Dec. 18, 1900.

—that of the Regular Army. This contains practically all the forms that we need in our militia work, besides a number with which we need not concern ourselves at present. Let us consider the use of a few of the most important ones.

The first duty of a newly assigned medical officer is to provide himself with the necessary materials of all sorts. He procures these by making out a "requisition", which is simply a statement of what he wants, on the regular form provided. He makes this in duplicate, keeps one copy for his own records, and forwards the other through regular channels; that is to say, he sends it to his next senior adjutant. What becomes of it afterwards is the latter's business.

By and by the supplies arrive, perhaps all he has asked for, perhaps only such articles as his seniors think fitting, and with them comes an "invoice" in duplicate,—a list of the articles, signed by the officer issuing them. He verifies this list, makes sure that everything is there, then files it among his records, and makes out a "receipt" for them, in duplicate, keeping one copy and forwarding the other to the officer from whom the supplies came.

The property is now in his hands; he is charged with it, and held responsible for it; and his next duty is to put down each item in his "property book" stating how each item came into his possession, whether issued by so and so, turned over by so and so, purchased or found. In the U. S. army a distinction is drawn between "expendable" articles, chiefly drugs and dressings, and articles of permanent usefulness. At the supply depot one class is charged in an officer's account in red ink, and the other in black. He is not required to put down expendable articles in his property book, simply signing a receipt as a voucher for the officer issuing them. At every permanent post hospital an annual statement of the amounts of various articles on hand is required.

The next question is, "How does all this property pass out of the officer's hands, and how is he released from further responsibility for it?" As I have said, some articles may be expended, that is, used up, in the daily work; others may be

lost or broken; others may be condemned by an inspector and ordered to be sold. Forms are provided for separating all such occurrences. But the commonest way of disposing of property is by "turning over" to some other officer. In this case blanks are filled out in duplicate of articles turned over by A to B, by order of C (A had also better keep a copy for his files), and sent to B with the articles. B returns a receipt for the same, in duplicate, and keeps a copy himself. He then notes the articles in his property book as turned over by A on such a date.

Every six months he must make a report of property in his possession. He begins with his account as it stood at the end of the last six months, puts down every article received or disposed of since then, giving in every case the manner of receipt or disposal, sums it up, and forwards a copy, keeping the original in the property book. With this he forwards copies of all invoices of articles received or turned over by him, and also of receipts from other officers for articles turned over to them.

In all cases where papers are made out in duplicate, one copy should be marked original and the other duplicate.

So much for property. The remaining papers pertain chiefly to strictly professional matters.

The first of these is the morning sick report, which is the summing-up of the several company reports. Our custom of holding sick call before breakfast, and making out the report at once, is very inconvenient, as it results in everything being done in a hurry, and obliges the officer who makes it out to breakfast alone after the rest of the mess have finished.

Every man who appears in the sick reports should also be put down in the register of patients, with diagnosis, dates of falling sick and of recovery, and final disposition of case.

Once a month there is copied from this book and forwarded a list of completed cases, through medical channels. Once a month a sanitary report is forwarded. Any epidemic outbreak calls for a special report. After every battle a special list of wounded must be sent. Every recruit examined must

be properly recorded; every patient transferred to another hospital must be so recorded on the books, and must be accompanied by a proper transfer slip. In Massachusetts any accident or serious occurrence must be at once reported, in duplicate, on the emergency report. Sometimes a record of the weather is ordered to be kept. If funds for any purpose are put in an officer's hands, he must account for them very carefully.

All this seems at first a tremendous mass of wearisome detail; but one gradually learns, first, that Uncle Sam insists that these things *shall* be done in just his way, and no other; and, second, that his way is apt to be the easiest in the end, and, indeed, the only way in which one can acquit himself of responsibility and be square with the authorities.

At a certain stage of his progress one is apt to get the idea that government cares little what he does with his patients, so long as he reports them nicely; but later he will change his mind, especially if the inspecting officer is wide awake.

Finally, let me advise every officer to keep in his files and letterpress or copy book either originals or copies of practically everything official that passes through his hands. Some day some one of them may prove of very great value to him.

In 1898 one great trouble of the volunteer medical officer was his inability to find out just what government wanted him to do, how it wanted him to do it, and what equipment it meant him to have. In my own case, no inspector came near me, and I received not a word of instructions for over three months. If General Blood had not helped me, the regiment and I might have fared badly. It seems to me that a small book of "Instructions for medical officers" should be issued, telling concisely their duties under various circumstances, how to go about them, and what equipment is proper. Its weight in gold would have been a very conservative estimate of the worth of such a book to me in the summer of 1898.

THE MAHAN BOARD IN ACTION.

By DUDLEY NEWCOMB CARPENTER, M. D.

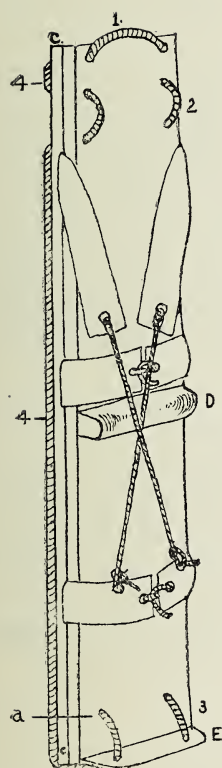
PASSED ASSISTANT SURGEON (LIEUTENANT J. G.) IN THE
UNITED STATES NAVY.

MEDICAL DIRECTOR C. U. Gravatt, U. S. N. called attention to this board in an article which appeared in the Proceedings of the Association of Military Surgeons of the United States for 1900, and he recommended its general adoption by the North Atlantic Fleet. The object of this present article is to emphasize the value of the board as the best solution we have at present, for the transportation of wounded on shipboard, and to point out certain changes which simplify its construction. In carrying out the suggestions that came to mind, Carpenter's Mate John W. Walker, now on this ship, who made these boards for Surgeon Ames, should receive full credit. The drawings explain themselves, but attention is called to the following differences in construction from those in general use.

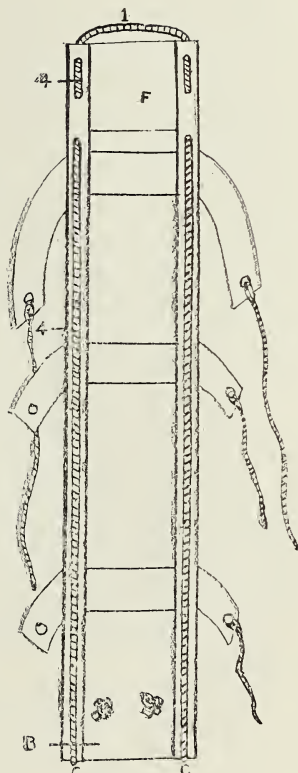
1. Narrow canvas bands with single buckle or lashing. These are sufficiently strong to answer every purpose, and are quicker to fasten.

2. A cross band instead of a thoracic belt. The advantages are that there is less pressure and confinement of the chest, which is of primary importance to an injured person, and also prevents slipping toward the head end of the board, should the foot end be suddenly raised. The buckles or fastenings of this cross band may be fastened to the pelvic or leg straps, which are provided with extra eyelets.

3. The rope is so reeved that it acts as handles for a level surface, takes up the strain of the entire body when the board is used to hoist wounded by the loop at the end, and running along the grooves in the wooden runners becomes an



Front and Side View



Back View.

Construction of the Mahan Board.

A—Pine board 76x11x1 inches.

B—Back of same showing straps beneath board and ends of rope.

C—Pine runners 76x2x1 inches, grooved for $\frac{3}{4}$ inch rope.

D—Pine buttock block 14x3x3 inches.

E—Pine foot-rest 14x4x1 inches.

F—Pine brace, head end, between wooden runners, 10x8x1 inches.

Canvas straps 5 inches broad, to fasten by buckle or lashing; slide between board and runner which is cut for them.

Reeving-rope $\frac{3}{4}$ inch Manila

1—End loop for hoisting, dragging and sliding.

2 and 3—Handles for lifting and carrying.

4—Buffers and runners.

Buttock-block, foot-rest, brace, and runners, screw on to board. The whole apparatus to be stained any color desired.

elastic buffer to break the jar if the board slides down a ladder or is set on the deck heavily.

Undoubtedly Surgeon Stitt's bar and hammock, that was adopted July 13, 1895, by the Navy Department, was the simplest solution of all the complicated apparatuses which had been devised for transporting wounded since modern ships have been constructed. This present board is only a further evolution of the hammock-method of transportation, for on some ships boards are used to cover the ladders, down which these hammocks slide; with this apparatus the straps take the place of the hammock and the board itself slides instead of being placed on a ladder.

In a similar manner Medical Director John C. Wise's Stretcher slid down boards placed over ladders.

In his article that appeared in the Proceedings of the Association of Military Surgeons of the United States for 1900, he mentions the following report of a Board of Officers; the suggestions of this Board for every apparatus to fulfill might well be taken for imperative canons.

1. Simplicity, speed of application, manipulation and transport.

2. Ease of stowage.

3. Usefulness for shore transportation.

4. Security of the occupant.

5. Suitability to present ship construction.

Those who have used this board can testify that it completely fulfills these requirements. Its simplicity of construction renders it possible to have as many boards on a ship as the number of the crew demands, and in time of action, these can be placed near the guns on each deck ready for use. At the hatch leading below is a rope which can be made fast to the end loop for lowering the board if necessary, but generally it will slide down the ladder, steadied by one man. On a level surface the side handles can be used to carry the patient. Wherever the bar and hammock can go this board can go; down below into the fireroom, through an air-lock, or up to the fighting tops by means of the ammunition whip. Its

advantage over the bar and hammock lies in its simplicity for suspension and its use as a litter for sliding down ladders. In cases where a limb is fractured the board acts as a splint to prevent movement. On a level surface it is as easy to handle as any stretcher. One man can place another upon this board, and unassisted drag him to the nearest ladder by means of the end rope, the rope runners sliding smoothly over the deck. This advantage of transportation by one man is a feature of the "Ambulance Sleigh", recently described by Fleet Surgeon Gilbert Kirker, R. N. The only disadvantage of the board is that it does not fold and therefore is awkward to carry, if with a landing force ashore. It could be made to do so at the sacrifice of simplicity and strength by using canvas stretched between the wooden runners, and carrying out all other features of the apparatus. The Wise litter had to be used with a board when sliding down ladders and therefore no advantage would thus be obtained. The Mahan board is essentially for use, on a ship, in a boat, or for transporting wounded, from a ship or a boat, to the shore. Extended service with a landing force would require the folding litter, no better substitute having as yet been found by the Army.

U.S.S. Illinois, December, 1901.



Reprints and Translations.

SWORD WOUNDS OF THE HEAD.

By CAPTAIN C. C. BARRY,

INDIAN MEDICAL SERVICE.

DURING four years' duty as Resident Medical Officer at the Rangoon General Hospital I have had to deal with a very large number of sword or *da* wounds, some 300 to 400 a year.

The reason for this is that the city of Rangoon is a large and populous one, and the General Hospital not only draws its cases from this city, but also from an outlying district some hundreds of square miles in extent.

In the district nearly every Burman carries a *da* or sword, and in the city a very large proportion of them possess one in their houses. The Burman, moreover, is of a very excitable disposition and uses his *da* on small provocation, and when he does so, he uses it with his full force.

The *da* in use is commonly of two kinds: the one in every day use for cutting jungle, chopping wood, &c., is square at the end and heavier and broader at the end than at the handle; and the other, used as a fighting weapon, is long, curved and pointed. Both are very powerful weapons, and with a little practice they can both be made to cut in a wonderful manner; in addition, also, both kinds of swords are kept very sharp.

As a consequence, a large and often a fatal wound can be inflicted with one good slash of a *da*. Sword wounds of the body and limbs have little of special interest, except that, as a rule, the operations for the repair of injury inflicted are long and tedious, including, as they often do, the wiring of divided bones and the suture of muscles, tendons and nerves; but it is sword cuts of the head and skull that are the most

interesting, and which present the greatest difficulties in determining what line of treatment it will be best to follow.

Sword cuts of the head vary in many ways. Some may be glancing cuts, removing entirely a shaving of skull with its adherent scalp, or a shaving of skull may be sliced off and left adherent by a flap of scalp; the shaving of skull, varying from any thickness up to that of the whole skull, or again the skull be cut through vertically with or without any accompanying depression of the skull. For particular treatment these injuries may be classified as below:—

- (1.) Complete removal of a piece of skull and scalp.
- (2.) Removal of a shaving of skull which remains adherent to a flap of scalp.
- (3.) Vertical wounds of the skull—
 - (a.) Partially through thickness of skull;
 - (b.) Completely through thickness of skull.
- (4.) Wounds accompanied by depression of the bone of the skull.

1. As regards complete removal of a piece of skull and scalp as long as the piece of bone does not consist of the whole thickness of the skull the wounds usually may be dressed antiseptically and do not require any further operation. As a rule, they do well and in one or two cases examined *post mortem*, there was no fracture or depression of the inner table of the skull. When, however, the whole thickness of the skull is removed, the wounds are generally very severe and do badly, for the brain is almost invariably injured, and *hernia cerebri* and *meningitis* are common.

2. In these cases in which a shaving of the skull has been cut off and remains attached to its flap of scalp the wounds usually do well, unless, as occasionally happens, the wound is very dirty, though, of course, the severity of the injury varies largely with the thickness of the skull cut off. In these cases also the inner table of the skull is, as a rule, uninjured.

It has been found best to re-adjust the flap, with its shaving of bone attached back into its original position with sutures through the scalp without further operation. But if, as

sometimes happens, the shaving of bone is so bent and distorted that the flap will not lie smooth and flat back in its original position, the piece of bone should be trimmed up with bone-cutting forceps till the flap can be made to lie easily and smoothly.

Again, should, as not infrequently happens, dirt have been so ground into the wound that it cannot be satisfactorily cleaned, it is, as a rule, best to remove the shaving of bone entirely from the flap thus ensuring thorough drainage, for it is often very difficult to allow for thorough and free drainage when adjusting a flap of bone and scalp, and should it appear likely that suppuration will ensue the shaving of bone is best removed.

3. By a vertical wound of the skull is meant a wound occasioned by a blow delivered at right angles to the curvature of the skull at the point of receipt of the injury. These wounds naturally occur chiefly on the vertex of the skull, but may occasionally be delivered laterally.

This class of wounds is especially important owing to the resulting injury to the inner table of the skull and also possibly as a consequence to the brain substance beneath.

These wounds may, for the purpose of treatment, be again subdivided into three minor classes:—

- (I) Wounds in which the outer table of the skull is cut into, but not completely divided.
- (II) Wounds dividing the outer table and cutting into the middle or cancellous table of the skull.
- (III) Wounds completely dividing the skull.

It is in wounds of the above nature that the question of the operation of trephining most frequently arises, and it is often a very difficult question to decide. The following views have been arrived at after the performance of a considerable number of *post-mortem* examinations and as the result of numerous experiments on the dead body.

In the first place it is of great importance to estimate whether the blow was received at right angles to the curvature of the skull or not. Many blows, though struck vertically, on coming in contact with the skull, glance sideways,

and whether this has taken place or not can almost always be determined by a careful examination of the wound itself.

Should therefore the blow be a glancing one, and should there be no grave head symptoms pointing to compression or severe injury of the brain substance, the wounds in Classes I and II, as a rule, require no operation and may be treated as ordinary scalp wounds exposing the bone of the skull. Should, however, the direction of the wound be at right angles to the curvature of the skull, wounds in Class I only may be left alone.

Those, however, in Class II under these circumstances require more thorough treatment, for there is almost invariably fracture and comminution of the inner table of the skull, and, as a consequence, not infrequently laceration of the brain substance beneath.

In wounds falling into Class III, I should always advise trephining and thorough examination of the wound whether the blow happens to have been actually vertical to the curvature of the skull or not. The inner table in these cases also is almost always comminuted and fractured, and till the wound has been thoroughly searched it is, as a rule, impossible to discover what is the true condition of affairs inside the skull.

In illustration of this point, I would mention a case happening recently. A Burman came to the hospital suffering from a *da* cut of the skull, $4\frac{1}{2}$ inches long on the vertex of skull, just above and more or less parallel to the temporal ridge. The blow had apparently been delivered at right angles to the curvature of the skull. For the posterior two-thirds of the wound the skull was cut clean through, for the anterior one-third the skull was cut deeply into but not completely divided. The patient had no head symptoms and walked to hospital being, however, weak from loss of blood. A crown of bone was removed and the whole line of the wound cut along with the bone-cutting forceps. Under the anterior one-third of the wound was found a loose piece of inner table $\frac{3}{4}$ inch long and $\frac{1}{2}$ inch wide driven downwards and inwards through the *dura mater* and lacerating the brain substance. This, together with several small separated fragments of inner table was removed. The patient, 14 days after receipt of the injury, was practically well, the temperature had only once risen above normal (just after the operation); the wound

had healed up, and he had no head symptoms at all. It was hardly to be hoped so successful a result would have been possible had not the wound been thoroughly explored in the manner above described.

4. Incised wounds of the skull with depression of the bone should be treated as ordinary compound depressed fractures of the skull, and the depressed bone elevated, and, if necessary, removed. Two years ago, in quoting the notes of 26 operations for compound depressed fractures of the skull performed at the Rangoon Hospital by Captain Duer and myself, attention was drawn to the good results obtainable by a free removal of the bones of the skull as a means of ensuring a thorough knowledge of the condition of the inner-table of the skull and the brain, and also for allowing for free drainage of the wound where necessary. The advantages of this free removal of bone have been fully borne out by subsequent cases. Several of the cases operated on have been seen at periods varying from one to three years after the operation, and the resulting inconvenience from the removal of even large areas of bone has been surprisingly small, and has in no case prevented the patient from following his previous occupation.

Should there therefore, in incised wounds of the skull, be any reasonable probability of the inner table of the skull being fractured and depressed it is, I believe, the best practice to operate at once and settle the question definitely.

The method usually followed has been to first remove a crown of bone with a trephine and then to quickly remove a strip of bone along the line of the incision in the skull with bone-cutting forceps (Stoffman's).

A probe bent at right angles is then passed along either side of the incision in the skull, and where fractured or depressed bone is felt more skull is cut away and the fragments of inner table removed and the condition of the brain thoroughly examined.

The scalp is then sewn up with sutures, and after extensive operations the wound is drained for 24 hours.

With the aid of powerful bone-cutting forceps, an operation of this nature can be quickly performed.—*Indian Medical Gazette*.

TYPES OF BULLET WOUNDS AS SEEN IN THE SOUTH AFRICAN CAMPAIGN.

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A BULLET wound is essentially a "penetrating" or "perforating" wound, but it differs most materially from penetrating wounds inflicted by sharp-pointed instruments, such as knives or trocars. This difference is due chiefly to the velocity of the projectile, and to a lesser degree to its bluntness, the consequence of these conditions being that all bullet wounds partake of the nature of contusions, and that, as a corollary, the tissues are liable to be injured beyond the immediate track of the bullet to varying distances.

ENTRANCE AND EXIT WOUNDS;—DIFFERENT KINDS OF BULLETS.

Typical Wounds Caused by Normal Small-bore Bullets.—A perfect, undeformed, small-bore bullet entering at right angles to the surface makes as a rule a round hole slightly smaller than the bullet itself. Around this aperture is a narrow ring about one-sixth of an inch in breadth, from which the cuticle has been removed, and which appears some hours after the receipt of the injury as a red border to the wound. A little later this ring, as well as the actual hole, is covered with a dark scab, which consequently is larger than the hole which it covers. The bullet in its passage inwards pushes in front of it the skin, which is thus brought into contact with the sides of the bullet and bruised by it. The projectile then passing on, stretches and perforates the skin, and gains admission through a hole which is smaller than the actual diameter of the bullet.

Atypical Wounds caused by Normal Small-bore Bullets.—When the axis of flight of the bullet is inclined at less than a right angle to the surface, the wound in the skin becomes oval, and the breach of surface therefore is slightly bigger. When the angle is very oblique the bullet traverses a certain track of skin, depressing it more and more until actual perforation takes place. The skin, therefore, is bruised and the cuticle destroyed for some distance from the aperture of entrance. This damaged area of skin shows as a red, raw place when the wound is recent.

The shape of the contused area is roughly that of an isosceles triangle with a rounded apex, and the sides are slightly bent outwards. The base is formed by the perforation in the skin. The breadth is often more than that of the actual bullet.

Bullets passing out through the skin obliquely make an oval aperture of exit, and this, if the line of flight is greatly inclined to the skin, is often of large size, but still remains oval. The skin is evidently pushed out and then burst. The width of such a wound is rather striking, and is due to the skin being unsupported and to the natural elasticity of the cutis causing retraction and gaping. It has been thought by some that such wounds are due to the setting up of expanding bullets, but the evidence does not confirm this, for in multiple wounds caused by the same bullet the second aperture of entrance is often quite round and small, although the first exit wound is large and slit obliquely. Some of these oblique wounds have measured 1 inch by $\frac{1}{2}$ inch and even more.

When a bullet traverses the surface of the skin so as to make a long graze it causes a surprisingly wide area of damage.

The following is a good example of this damage:

A soldier was shot while lying down. The bullet came from the front, and perforated the skin over the spine of the right scapula, then emerged, leaving a bridge of skin a third of an inch wide, and travelled down the surface of the body for 4 inches. The resulting slough was the same length, and at least $\frac{3}{4}$ inch broad at its widest place; from here it gradu-

ally tapered off. When the slough separated the surface refused to granulate, and was not healed at the end of a month from the receipt of the injury.

Ricochet Bullet Wounds.—In these cases the wounds lose more or less of their typical character according to the amount and kind of distortion the bullet has undergone. The round, oval, or slit-like wound becomes irregular, torn or jagged, for even if not greatly distorted after striking the ground, the bullet no longer continues to have its long axis in the axis of flight, and so may strike the body with its side, or partly with its side and base. In such cases the length of the wound will vary according to the actual position of the projectile at the moment of its impinging on the skin. Fragments of stones struck by bullets will also cause jagged irregular wounds. This is especially the case when the bullet strikes the body where it is in contact with the ground.

F. H. was wounded at Paardeberg on February 18th. He was lying down under a cross fire. The bullet entered just by the left anterior superior spine, and caused a lacerated wound $1\frac{1}{2}$ inch long. The clothes over the entrance aperture were also torn to a like extent. When the patient was dressed there was a wound just over the femoral artery, but of small extent and slit like. On March 10th the wound near the anterior superior spine was granulating healthily, and the slit over the femoral artery was healed. A hard core could be felt to join the two. The x-ray picture showed a bullet lying with its point towards the symphysis pubis under the groin wound. The bullet was found lying under the skin in the midst of gritty pultaceous material within a fibrous capsule. It was slightly flattened and grazed. The nickel plating was chipped off on one side at the base.

The explanation of this case seems to have been that the bullet hit the ground and the body almost at the same time, thus causing a large aperture of entrance, and then passing in it bruised the tissue against the ground, and finally lodged. Retained bullets were found under three conditions as regards the surrounding structures.

1. When extracted shortly after the receipt of the wound the bullet was lodged in a ragged blood-containing cavity.
2. Somewhat later a fibrous capsule was found, and

within this was the projectile surrounded with serous fluid.

3. At a since later period the fibrous capsule was found to have shrunk on to the bullet which it closely surrounded.

A certain number of lodged bullets were found, when extracted, to be lying inverted, with their apex towards the aperture of entrance, which was usually of the typical form, though contact with bone could in many instances be excluded. The explanation must be sought outside the body, and is due to one of two causes. In some cases it is the result of a ricochet.

In another class of case the turning over of the bullets is due to the wearing away of the grooves of the rifling by frequent firing; this was probably the cause of a bullet, which was extracted at the Portland Hospital, having entered the arm base first, for the projectile was quite smooth, and showed only the barest trace of the rifling upon its surface. It is the rapid twist of a long bullet that alone prevents it from turning head over heels soon after it leaves the rifle, and, if the spin imparted to the bullet be not sufficient it will soon commence to turn over on a transverse axis, and thus may actually enter the body base first.

"EXPLOSIVE" WOUNDS.

These wounds are practically always met with in connection with fractures of bone. There is no hard and fast line to be drawn between an ordinary typical Mauser wound and those that have been termed explosive, and all gradations are met with between the small round puncture of the former and the yawning opening of the latter. The wounds shown in slides [exhibited] are cases in point. It will be seen that these apertures are large and irregular. The entrance wounds were perfectly typical. There was no evidence to show that the bullets were anything else but perfect, small calibre bullets, and there was no sign of any fracture of bone. The bullets here emerged at an acute angle, and to this must be attributed the character of the wounds.

The extent of the exit wound, it must be borne in mind, has no invariable definite relation to the underlying damage.

although it may afford valuable indications thereof. The introduction of a finger will often show that although the exit aperture may be large, the skin is so undermined and the muscles so torn that a still larger irregular cavity is formed into which the ends of the fractured bone protrude, and this was especially well shown in cases of fractured femur.

Another form of wound is that in which the skin is blown away to a great extent. This is likely to happen if the bullet emerges from a subcutaneous bone, as the shin, and then there is a definite loss of substance so that a crater-like wound results.

A third form is that in which the muscles and tendons are torn, and at the same time extruded through the skin wound and form a protruding mass above the level of the skin resembling in some degree a fungating sarcoma, especially if seen for the first time some days after the infliction of the wound.—*British Medical Journal*.



Medico=Military Index.

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Editorial Department.

SURGEON GENERAL GEORGE MILLER STERNBERG,
UNITED STATES ARMY.

DURING a period so momentous in its history as the time of the Spanish American war, the United States army was fortunate in having at the head of its medical department a man of unusual versatility, energy and efficiency. The transformation of the conduct of affairs from the era of small things and close estimates consequent upon three decades and more of comparative peace to the liberal basis demanded by the people in the treatment of the sick of the army so quickly created and mobilized to relieve the struggling Cubans was accomplished by him with singular ease and success. Brigadier General George Miller Sternberg had been prepared for such administrative duties by six years of service as surgeon general, preceded by thirty-two years of work in the lower grades of his corps. He had qualified himself for scientific direction by professional experience extending over territory bounded only by the limits of his country and involving practical work upon the battle-field and amidst epidemics of disastrous character, and by profound special investigations into the cause of disease conducted in this country and abroad. The high character of his work had been attested by the official commendation of his commanding general for service at Bull Run, Gaines' Mill and Malvern Hill, by the hearty approval of the chief of his corps for service in the south and in particular during two epidemics of yellow fever, and by the reception of a brevet for gallant service in the performance of professional duty under fire in action against Indians.

The depth and scope of his professional work is indicated by the number and extent of his contributions to professional literature. His work on Bacteriology now in its third edition is recognized as a classic, of which his edition of Magnin's Bacteria was a worthy precursor; his monographs upon yellow fever have added greatly to the reputation of American research; his studies in croupous pneumonia, typhoid and cholera were epochal in character; his investigations into disinfection and his original work in connection with pathogenic micro-organisms have been of the highest value; his book upon Malaria and Malarial Diseases together with his journal articles upon the subject, form a peculiarly well-rounded compendium of the subject; while his work upon Serum Therapy has been crowned with the highest praise.

His professional standing has received abundant recognition at the hands of the profession. He has twice received the degree of LL.D. and has been made an honorary member of the Epidemiological Society of London, the Royal Academy of Rome, the Academy of Medicine of Rio Janeiro, the American Academy of Medicine, and the French Society of Hygiene, while also honored from time to time by election to the presidency of the American Medical Association, the American Public Health Association, the Biological Society of Washington, the Philosophical Society of Washington, the section on military medicine and surgery of the Pan American Medical Congress and the Association of Military Surgeons of the United States, of the latter of which he has always continued to be an active and interested member.

He founded the Army Medical School, and inaugurated the custom of assigning officers to stations in large cities where they might have the advantage of abundant laboratory and clinical facilities. He established the laboratories of bacteriology and hygiene in connection with the army medical museum, and furnished facilities for such work in every military post. He encouraged scientific work by the members of his corps and brought the medical staff of the army to the highest state of professional efficiency. His frequent tours of

inspection, including Cuba and the Philippines in his itinerary, have given him a personal familiarity with the needs of the service which has never failed to redound to the advantage of the officers under his direction.

General Sternberg has from the beginning evinced great interest in the work of the Association of Military Surgeons and during his presidency the membership made its greatest strides in numbers. When the Spanish war required an increase in the medical staff, he selected the new officers largely from the Association membership, believing that the training and instruction gained in the work of the Association conducted greatly to the efficiency of its members and adapted them markedly to active service.

The declaration of war with Spain found him ready, and in the face of great legislative embarrassments and administrative obstacles, he conducted the system of aid to the ill and injured with singular efficiency. The enormous addition to his labors due to a sudden multiplication of the combatant force by ten and the retention of the permanent strength at four times the ante-bellum number has been met by him readily and easily. Performing duties many times more arduous and responsible than those of a Major General, he has remained a Brigadier General although the medical profession of the country has unanimously urged the advancement of the surgeon-generalcy to the grade of Major General, the American Medical Association and many other organizations adopting without solicitation resolutions to that effect prepared by the writer during his first term as Secretary of the Association of Military Surgeons.

He instituted a corps of female nurses for service in permanent hospitals; he established a sanitarium at Fort Bayard for the treatment of pulmonary tuberculosis; he created a special surgical hospital at Washington Barracks; he organized additional schools for the hospital corps and developed and improved those already established; he accorded special facilities of many kinds in medico-military work at numerous points throughout the country; he supervised the organization in our tropical and uncivilized dependencies of a system of

care of the disabled so efficient as to result in a sick rate so low as to be unprecedented in history.

He has been eminently a man of works, and his accomplishments along administrative, scientific and professional lines have made an impression in history that will never be forgotten.

JAMES EVELYN PILCHER.

RECENT PROBLEMS IN MEDICO-MILITARY ADMINISTRATION.

IN a recent address before a meeting of the medical officers of the Ninth Corps of the German army, Generalarzt Meisner discussed fully and eloquently the advances in medico-military affairs during the past century. He compared the conditions of the present with the past, much to the advantage of existing conditions.

A hundred years ago, medical aid never arrived until the battle was ended. Larrey, it is true, had established his *ambulances volantes*, but they had not been adopted to any extent even in the French army. It was not yet known that prompt aid would save a large proportion of those injured by the arms of that day, and even had it been realized, the kinder spirit of future times had not yet emerged to incline the combatants to make such efforts. The nineteenth century, indeed, has made many advances along the line of relief to the sick and injured, but there still remains ample work for the progressive medical officer of the twentieth century.

This has recently been conspicuously brought before the medical profession of the country by means of a valuable paper read before the Cincinnati Academy of Medicine by Major W. O. Owen of the army. Major Owen, in a very modest and repressed fashion, directed attention to the evils of administration of medico-military affairs when controlled by officers of the line. His instances of damage to the health of military commands through the presumption and sanitary ignorance of certain officers of the line might have been multiplied a hundred fold, although it is proper to remark that this con-

dition is not the rule but the exception, the majority of line officers of the army being most favorably and kindly disposed toward all efforts designed to benefit the sick and injured soldier. There are enough exceptions to this attitude toward the work of medical officers, however, to involve our forces in danger of most serious disaster. The evil results of the failure of medical and surgical supplies to reach Tampa in time for the invasion of Cuba have been dwelt upon, but the fact that the predecessor of the general who commanded that force declined to permit the establishment of other than regimental hospitals is not so widely known.

The conclusions of Major Owen are embodied in "an Act to define the duties of the Medical Department of the Army of the United States," which specifies particularly that the Medical Department shall have charge of—

"1. The direction of measures for the prevention of the ingress of disease among the troops of the army and of sanitary faults in location, construction (and management) of posts and camps,

"2. The medical and surgical care of diseased and injured officers and soldiers of the army of the United States; the physical examination of all officers and soldiers entering or leaving the army of the United States,

"3. The care (of) and accountability for all transportation pertaining to the movement of men and supplies of the Medical Department and (of) the sick and injured of the army,

"4. The preparation and preservation of the records of transactions taking place under the three preceding paragraphs,"—

and provides in addition for the trial and punishment of either the medical officer or the commanding officer at an infected point in case an unusual outbreak of disease shall have been shown to be due to his carelessness or inattention. These propositions of Major Owen cannot but meet the approval of every progressive student of military sanitation.

A further defect in the system of aid to the sick and injured, and which also participates largely in the causation of failures to properly administer the care of sick and wounded soldiers, is the insufficient number of trained military medical

officers available for service. This fact will undoubtedly be fully discussed and demonstrated in the essays soon to be submitted in the competition for the Enno Sander prize. It is worth while, however, to mention here the work of the Committee on Legislation formed by the medical officers stationed in the Philippine Islands, than whom none are able more fully to appreciate the embarrassment to the medical corps and the damage to the service of the sick and injured inflicted by a paucity of medical officers of suitable training and education. These gentlemen have prepared an act* to remedy this defect in the present organization of the medical department.

The statement accompanying this proposed legislation is so cogent and impressive that it is worth reproducing for the information of our readers. The object of the act, the argument states, is to provide, primarily, for a more satisfactory rate of promotion, and to serve as an inducement for capable and desirable candidates to enter the Medical Department of the United States Army. The law now in force, provides for such a large number of the lower grades and small number of the higher, that it has been found impossible to induce a sufficient number of candidates to present themselves for admission to the Medical Corps. There are about seventy vacancies, and although since the passage of the act of February 2, 1901, Examining Boards have lowered the standard of examinations, there appears no prospect of a possibility of attracting a sufficient number of properly qualified young men, to considerably reduce this very large percentage of vacancies.

Under the older organization of the Medical Corps, an As-

*AN ACT TO INCREASE THE EFFICIENCY OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.—Be it enacted by the Senate and House of Representatives, of the United States of America, in Congress assembled, that from and after the approval of this Act, so much of Section 18, of Act 4300, approved February 2, 1901, as provides as follows:

"Eight Assistant Surgeons-General, with the rank of Colonel, twelve Deputy Surgeons-General, with the rank of Lieutenant-Colonel, sixty Surgeons, with the rank of Major, two hundred and forty Assistant-Surgeons, with the rank of Captain or First Lieutenant," shall be and is hereby amended to provide as follows:

Ten Assistant Surgeons-General, with the rank of Colonel, twenty Deputy Surgeons-General, with the rank of Lieutenant-Colonel, eighty Surgeons, with the rank of Major, two hundred and ten Assistant-Surgeons, with the rank of Captain or First Lieutenant.

Provided, that all other provisions of the said Section 18, Act 4300, shall remain in force, and that nothing in this Act shall be held or construed to change any other portion of said Act 4300, approved February 2, 1901.

sistant Surgeon served eighteen to twenty years before obtaining promotion, but under the present organization, the junior officers of the Corps will be required to serve upwards of thirty years before reaching the grade next above that of Assistant Surgeon, and in case they reach this rank prior to retirement, they would certainly be retired with the rank of Major. Former legislation provided for promotion which compared fairly favorably with the other branches of the service, and as there was a reasonable prospect of reaching the grade of Colonel before passing upon the retired list, naturally an active competition for admission to the Medical Corps prevailed. The Army Reorganization Act of 1901 has now so greatly increased the lowest grade, that the incoming Assistant Surgeon cannot hope to attain the grade of Lieutenant Colonel before retirement, and it is probable that many will fail to attain even that of Major, and be compelled to go upon the retired list as Captains, after many years of service. The Medical Department is graded for rank, promotion and pay below every other staff department in the army, and, with the exception of Second Lieutenant, is graded below the line. A medical officer under the provisions of the present law, to obtain a Colonelcy, must pass through three times as many files as an officer of the Quartermaster's, Subsistence or Pay Departments; through more than twice as many files as an officer of the Engineer or Ordnance Departments, and more than one and one-half times as many as an officer of the Signal Corps. Officers of the line, having attained the rank of Major, have to pass through but four files to obtain the rank of Colonel, while the medical officers have to pass through nine files.

All these facts are fully appreciated by the younger physicians of our country, and by the Volunteer and Contract medical officers, hundreds of whom are now serving with troops and they are declining to become candidates for a position offering such an unpromising career and so little in the line of promotion and emolument.

The health of the army lies at the foundation of the efficiency of the Medical Department, and if the latter is crip-

pled, it follows as a necessary corollary, that the sanitary supervision of the troops, and their care in illness and injury must necessarily suffer. The medical officer is found at every possible point of danger, among the diseased in hospitals, shoulder to shoulder with the men on the firing line, and in his humanitarian mission, has frequently succumbed to the ravages of infection and disease, or fallen a victim to the enemy's bullets on the battle field. Since he, as a member of the military establishment, is of equal importance with the members of other staff departments and of the line, there should be extended to him the same opportunities for promotion that are found in other branches of the Army.

To correct this condition an increase of two Colonels, eight Lieutenant Colonels and twenty Majors, a total of thirty, and, as an offset, a decrease of thirty Assistant Surgeons is proposed, thus maintaining the same number of medical officers that now constitute the Medical Department, and the same ratio as formerly existed.

If any misgivings should be felt that there are not abundant and suitable posts of duty for these officers of higher rank, the following named stations are cited as proper and commensurate posts of duty for all the Colonels and Lieutenant Colonels now in the service and the additional ones contemplated by the proposed act:

STATIONS FOR COLONELS.		No.
Headquarters Division of the Philippines	- - - -	1
Headquarters, 12 Departments: ten in U.S., two in Division of the Philippines	- - - -	12
Surgeon-General's office	- - - -	2
Curator of Army Medical Museum	- - - -	1
Total	- - - -	16
STATIONS FOR LIEUTENANT COLONELS:		No.
Headquarters seven (7) separate brigades, each brigade comprising from 3,000 to 12,000 troops	- - - -	7
Surgeon-General's office	- - - -	2
Four Medical Supply Depots	- - - -	4
Presido General Hospital, San Francisco, Cal.	- - - -	1
Army and Navy General Hospital, Hot Springs, Ark.	- - - -	1
First Reserve General Hospital, Manila, P. I.	- - - -	1
Artillery School, Fortress Monroe, Va.	- - - -	1
Infantry and Cavalry School, Fort Leavenworth, Kans.	- - - -	1
U. S. Military Academy, West Point, New York	- - - -	1
Attending Surgeon, Washington, D. C.	- - - -	1
Soldier's Home, Washington, D. C.	- - - -	1
Total	- - - -	22

There exists then a total of thirty-eight places for the thirty officers proposed, still further reduced by the allowance of five per cent which must be made for sickness, leaves of absence and other contingencies.

The re-adjustment of grades suggested will provide for satisfactory promotion and induce many competent civilian, Volunteer and Contract Surgeons to present themselves for admission to the Corps, who are now deterred from so doing by the gloomy outlook. It is believed to be certain that unless the relief asked for is accorded, the Army Medical Corps cannot be filled with well qualified physicians, and that the military service in the end will be seriously embarrassed.

The facts thus stated by the committee on legislation of the medical officers on duty in the Philippines are cogent and convincing, and involve but a modest rehearsal of the real conditions, demands and dangers threatened by a continuation of the present perilous situation, and the movement should meet with the hearty cooperation of every military surgeon.

The development of a Public Health Corps, as contemplated in the reorganization of the Marine Hospital Service, also looks toward the improvement of the system of medical aid in military and naval work. The proposed act also brings out the desirability of greater harmony in organization and administration between the various public services, the projected military features of the new corps being entirely in line with this desirable consummation.

One of the objects of the Association of Military Surgeons is to bring about unity of action in the various medical services, and to more fully accomplish this, the establishment is urged at an early period of a standing committee on legislation, composed of the most active, influential, and alert members of the Association, who shall unite with the various services in organizing and supporting the enactment of legal provisions for the perfection of our system of medical care for the injured and afflicted soldiers and sailors.

JAMES EVELYN PILCHER.

THE SWEDISH ASSOCIATION OF MILITARY SURGEONS.

THE Association of Military Surgeons of Sweden celebrated its quarter-centennial in July, 1900. It was organized as the result of an invitation by Surgeon General Edholm at the rooms of the Military Society in Brunkberg's Hotel in Stockholm. Forty-one medical officers responded to the call and formed an association with the objects of establishing a literary center for Swedish military surgeons, to advance military medicine and to promote and develop military hygiene and the care of the sick. A constitution was adopted and it was decided to publish a journal and to collect a library. During the twenty-seven years that have passed since the establishment of the Association it has consistently advanced along the lines of work laid out, and has been a material inspiration to the development of special studies both by general cooperation throughout the entire Association and by mutual assistance in district branches.

A relief fund has been established by annual contributions, bequests and donations, so that it is now very considerable in amount. By means of the income derived from it, the Association has been able to render much aid to needy widows and daughters of deceased medical officers.

A recent publication* celebrates the quarter-centennial *festskrift* by an illustrated biography of each member. The portraits are small but clear and the biographical notes constitute an outline of the official history of the various individual members, and form a most attractive and instructive work. The Journal of the Association, the *Tidskrift i militär Hälsovård* has been successfully published for twenty-seven years and has been a continuous and effective source of inspiration to the membership. It is worth noting that in Sweden, *esprit de corps* is particularly strong in the military medical department, a fact mainly attributable to the influence of the Association.

JAMES EVELYN PILCHER.

**Svenska militärläkareföreningen. 1875-1900. Porträtt och Biografier.*

"AN EXAMPLE WORTH FOLLOWING."

THE Association highly appreciates the compliments paid it, in connection with the establishment of the JOURNAL and begs to tender its thanks to the many kind friends who have spoken so kindly of its efforts to promote the science of military surgery. The *United Service Magazine* of London, in course of a particularly comprehensive and appreciative review, remarks that "it is hoped that the example of the military surgeons of the United States will be followed by the Royal Army Medical Corps." *Le Caducée* of Paris publishes an appreciative comment under the caption of this note, remarking that, "judged by this [the ninth] volume, such meetings are most profitable, not only because of the instruction afforded to military surgeons but because of the progress developed in Medico-Military science." It may be interesting to state that great interest in the work of this Association is also manifested by our own officers, the accessions to membership during the first half of the present year having been nearly double the number received during any previous entire year.

THE MASSACHUSETTS VOLUNTEER MILITIA
SCHOOL FOR MEDICAL OFFICERS.

TWO collections of brief papers show the character of the work done in as many sessions of the Massachusetts school for medical officers held in December 1900 and April 1901 respectively. Eleven papers were read at the former and fourteen at the latter session. They cover a wide field and indicate a high degree of interest in medico-military affairs and an equally high degree of ability to treat them. Eleven of the papers pertain to military hygiene, ten to medico-military administration, three to military surgery and one to military medicine, although the fields of medicine and hygiene overlap so much that there might be a difference of opinion

as to the proper place of some of those so enumerated. Massachusetts is to be congratulated upon the fine showing made in the work of her school

THE PROGRAM FOR THE NEXT MEETING.

THE Literary Committee has already been notified of the titles of a very satisfactory number of papers in preparation for the next meeting of the Association and there is every prospect of a full and interesting program. It is proposed to make the discussion of the more important topics presented a prominent feature of the exercises, but to do this requires time to make the necessary arrangements. The Committee earnestly requests, therefore, that each writer will, unless he has already done so, notify some member of the Committee, or the Chairman, Col. C. H. Alden U.S.A. retired, Newtonville, Mass., of the subject selected as soon as practicable. Such information should be received not later than April 25, 1902, in order that as full a program as practicable may be announced in the May JOURNAL.

BOLO WOUNDS.

IT is desired to make a collection of experiences with bolo wounds for the information of the Association. Surgeons having had such cases under observation are urged to forward accounts of them with or without remarks, to the editor of the JOURNAL.

Reviews of Books.

PRELIMINARY NOTICE OF THE THIRD EDITION OF SURGEON GENERAL STERNBERG'S BACTERIOLOGY.*

THE very important role which micro-organisms play in the work of the military surgeon renders the production of a treatise on the subject by an eminent military medical officer especially appropriate. With the first edition of his work, which appeared as "A Manual of Bacteriology," General Sternberg at once became widely recognized as the standard authority on Bacteria. The second edition,—in which the attempt to include all species or distinct varieties distinguished at that date was abandoned, and from which the bibliography and the descriptions of many non-pathogenic species were omitted in order to permit of the introduction of much essential new matter,—differed so materially from the first that it was considered deserving of a new name, and was called the "Text-Book of Bacteriology." A third edition now appears as the "second revised edition" of the latter.

In order to avoid in this edition the unwieldy bulk, which it would have attained through the recent growth of the subject, still other matter of minor importance has been excluded and room has been made for much new information, particularly in two new chapters on the "Bacteria of Plant Diseases" and "Protective Inoculations in Infectious Diseases" respectively. The plan of presenting the text in two sizes of type, distinguishing the more important and less essential facts is an admirable feature of the work, well worth imitation by every writer on scientific subjects, and renders the use of the book as a work of reference much more convenient.

***A Text-book of Bacteriology.** By GEORGE M. STERNBERG, M.D., LL.D., Surgeon-General United States Army. *Second revised edition.* roy 8vo. pp. xii, 708. 198 illustrations. New York: WILLIAM WOOD & Co. 1901.

Of the new chapters, that on Protective Inoculations is the most immediately practical in its application and concerns itself with every affection in which the method may be concerned, including:—

Anthrax,
Bubonic Plague,
Chicken cholera,
Cholera,
Diphtheria,
Foot and Mouth disease,
Glanders,
Hog cholera,
Hog erysipelas,
Hydrophobia,
Influenza,
Influenza in the horse,
Pleuro-pneumonia in cattle,
Pneumonia,
Rinderpest,
Swine plague,
Streptococcus infection,
Symptomatic anthrax,
Tetanus,
Tuberculosis, and
Typhoid fever.

The discussion of protective inoculations in these affections is comprehensive and detailed, comprising nearly a hundred pages and amounting to a complete treatise in itself upon serum therapy. The value of the practice in cholera is discussed and the opinion expressed that immunity in man may be accomplished by the ingestion of considerable quantities of sterilized cultures, although the matter still lies open for further investigation. Immunization against diphtheria is fully and favorably considered, but in typhoid, "this method should not be relied upon as a substitute for those sanitary measures which must be our main reliance for the prevention of epidemics of this disease, viz., sterilization of drinking water, disinfection of excreta, sanitary police of camps, etc." Hydrophobia brings out a discussion of the experiments in the Pasteur laboratories and the results and conclusions derived therefrom, and encouraging but non-evidential reports are

quoted with regard to the treatment of tetanus and tuberculosis.

The comprehensive and systematic character which renders the book serviceable alike as a laboratory guide, a textbook for the student, and a work of reference for the practitioner, is fully maintained in the other chapters, each of which has been thoroughly revised and brought up to date. The text is profusely illustrated with numerous accurate and graphic illustrations in black and in colors and is in no respect wanting in the qualities necessary easily to maintain its position as the chief authority on the subject of which it treats.

JAMES EVELYN PILCHER.

SURGICAL AND MEDICAL HISTORY OF THE JAPAN-CHINESE WAR.*

THE publication of this report in English by the Japanese Naval authorities is stated by them in the preface to be due to a sense of "duty to the medical profession. * * Much has been written about the wounds received in wars on land, indeed the Medical and Surgical History of the American Civil War is full of interest and information. Of naval warfare we possess no medical history; the lessons of Trafalgar and Lissa, and war between Chile and Peru have been lost to us, and there has been no previous experience of the treatment of wounded on ships since the modern revolution in naval warfare."

This is a large, well-bound volume of 544 pages, translated into excellent English by Dr. Suzuki and unusually free from typographical errors. The book contains a number of good illustrations in colors, by Japanese artists, of wounds and injuries received in the Japanese naval forces. It may be said at the outset that the work reflects much credit on the medical authorities of the Japanese Navy, and impresses the

*The Surgical and Medical History of the Naval War between Japan and China, during 1894-95. Translated from the original Japanese report by S. Suzuki, Deputy Inspector General of Hospitals and Fleets, Tokyo. 1901.

reader with the marvelous progress made along scientific lines by the Japanese nation since it was opened up to modern civilization by United States warships scarcely a generation ago. The book contains much valuable information which will not be found elsewhere, and should be read not only by naval surgeons, to whose work in warfare the subject matter is especially applicable, but also by medical officers of the military arm of the service, who are liable to observe wounds of a character similar to those seen in naval warfare after artillery duels, during sieges or as a result of bombardment of land fortifications by hostile fleets.

In character, the wounds observed during the Chino-Japanese War were practically limited to such as would be produced by large projectiles, fragments of exploding shells, fragments of metal and wooden splinters. In addition, a considerable number of burns and scalds were incurred. The total number of cases of wounds and injury was relatively small—amounting to but 371—but these cases were so studied by the Japanese authorities as to be of more value than a larger number of cases less carefully elaborated. The book consists of nine sections, each divided under numerous sub-headings. Section I deals with the various battles of the war, with the injuries resulting therefrom. Section II gives a history of the killed and wounded, classified by regions. Section III is of a statistical nature, dividing the killed and wounded into groups according to varying conditions. Section IV relates to the causes of the wounds received, and the characteristics of the wounds as dependent thereon. Section V treats of the complication of wounds observed. Section VI relates to the management of the wounded on ship-board. Section VII discusses the diseases experienced on board ship during the war, together with such wounds or injuries as were not the result of warfare. Section VIII treats of the sanitary conditions influencing the health of the command during the war. Section IX is devoted to a consideration of the work done in the various naval hospitals during the war.

The general scope of the book is indicated by the above

sections, but it is impossible, in the space of a brief review, to touch upon the many individual points of interest which the work presents. One can only say that the book is a noteworthy addition to the scanty literature of the special subjects of which it treats, and that it should be carefully studied by medical officers of our naval and military forces, who are under many professional obligations for this latest work of their confrères of the Japanese Navy. The book is a Government publication and is understood not to be on general sale, but copies have been distributed to the larger libraries, where they will be available for reference. EDWARD L. MUNSON.

THE RECENT SURGICAL WORKS OF COLONEL NICHOLAS SENN.*

THE abundance in good works of the author is particularly manifest in the appearance of three new books under his name during the brief period of twelve months,—a new and minutely revised edition of an earlier work, a carefully edited American version of a classical treatise by a distinguished German colleague, and a comprehensive presentation of the practical ideas and methods matured by a quarter of a century of study, practice and experiment in peace and in war.

In reviewing the first edition of the *Principles of Surgery* twelve years ago, the writer remarked, the book “affords a superb illustration of his [Colonel Senn’s] art of clear presentation.” In the editions that have succeeded, this characteristic has continued to a conspicuous extent. This feature is so important, and so deficient in many otherwise valuable

**Principles of Surgery.* By N. SENN, M.D., PH.D., LL.D., *Third edition.* 8vo. pp. xiv, 699, Philadelphia, F. A. Davis Co., 1900.

Surgical Technic. By FR. von ESMARCH M.D. and E. Kowalzig, M.D. Translated by L. H. Grau, Ph. D. and W. N. Sullivan, M.D. Edited by NICHOLAS SENN, M.D. Sq. 8vo, pp. xl, 866, New York, The Macmillan Co., 1901.

Practical Surgery: A Work for the General Practitioner. By NICHOLAS SENN, M.D., PH.D., LL.D. 8vo. pp. 1133, with 650 illustrations, many in colors. Philadelphia and London: W. B. Saunders & Co., 1901.

works that it is worth while strongly to emphasize it. The faculty of clear statement is not the property of every author, and the fuller the discussion of a subject the more nebulous the effect upon the mind of the reader. The presentation of an accurate analysis and resumé of every subject considered then is well nigh a necessity to the completeness of any medical and surgical treatise. The law schools have a series known as the "Hornbook Series," in which this feature is brought out with particular strength, resulting in a popularity and usefulness hitherto unprecedented in such text books. While entirely differentiated from the "Hornbook" style, the epigrammatic and comprehensive character of Colonel Senn's diction accomplishes the same purpose. The book has kept well abreast of the progress of surgery, which has latterly been so striking in this department of the art,—a fact which has necessitated the addition of a hundred pages of text, the re-writing of much of the contents of former editions, the re-drawing of many of the old cuts and the addition of over a hundred and fifty new illustrations. Two new chapters are added, on "Regeneration" and on "Blastomycetic Dermatitis" respectively, rounding out to completion a work which will long live as a monument to the didactic genius manifest in the author's utterances.

Professor Esmarch's prize essay on the Treatment of the Wounded in War, better known as the Surgeon's Handbook,—of which the first edition with fine colored plates was translated into English by Mr. H. H. Clutton, of London and the third edition was translated by Dr. B. Farquhar Curtis of New York,—has been a standard of reference for the military surgeon for twenty-five years. Its motto *kurtz und bündig*—brief and concise—was appropriate, but the portly volume to which it is now expanded, under the English title of *Surgical Technic*, seems rather less fitting. It is still *bündig*, but it requires a vast stretch of the imagination to consider it *kurtz*. The first edition consisted of two parts, the dressing of wounds and operations; the present is divided into twenty-one parts, the treatment of wounds, bandaging, narcosis, simple oper-

ations, operations on the nerves, skin and bones, amputations and disarticulations in general and of the upper and lower extremities, resection of joints and of the upper and lower extremities, operations on the head, plastic operations for fissure of the oval regions, and operations upon the facial cavities, the neck, the breast, the abdomen, and the pelvis, from which it appears that the original essay on the treatment of the wounded in war has developed into a complete treatise on operative surgery, including not only accident surgery but all other phases of operative work. The German work of General von Eschmarch left little to be desired but that little has been supplied by Colonel Senn in the American edition. It should be a part of the field surgical equipment of every military command. The shape particularly adapts the book to ready consultation and its broad pages easily lie open. For field service, however, the half morocco binding should be used, the cloth cover not being strong enough to stand the strain of active service.

In his *Practical Surgery*, we have Colonel's Senn's most important contribution to science and it is of particular interest to military surgeons, not only because of the teachings based upon the author's experience in the Illinois and Wisconsin National Guards, his observations in the Greco-Turkish war and his active service in the Spanish-American campaign, but because of the great interest which he has continued to manifest in medico-military affairs for many years. So, in the book now under consideration, while the entire text is worthy of careful and detailed examination, the references to the military side of surgical practice will naturally be of especial interest. The demands upon the military surgeon by the exacting and often onerous duties incumbent upon him in time of war are so succinctly and picturesquely stated that the temptation to quote them *au large* is not to be resisted. Colonel Senn believes that he must be "not only well versed in theoretical and practical knowledge of every thing pertaining to the practice of medicine and surgery, but he must be endowed with qualities

both of mind and body upon which he can rely when engaged under the most trying circumstances. In field work, he has often to perform the most difficult tasks with very limited resources. In such instances good common sense and deliberate action go much further in accomplishing what is desired than the finest scholarship and the most profound logical reasoning. The man who can in a few moments extemporize a well-fitting splint out of the simplest materials, and perform with the contents of the ordinary pocket-case the most difficult operation, will do vastly better work on the battlefield than most professors of surgery and the most brilliant operators in civil practice. The surgeon who understands the principles and practice of cooking is of more service to the troops than the one who can repeat word for word, the contents of the most exhaustive treatise on *materia medica* and therapeutics. The medical officer with a full knowledge of hygiene and sanitation and endowed with the faculty of making a rational practical use of it, is preferable to the most expert clinician, as in military practice, it is more important to prevent than to treat disease, no matter how successfully and scientifically the latter may be conducted. The all-round medical officer must be a good mechanic; he should know how to use the carpenter's and blacksmith's tools, how to row and sail a boat, how to make a raft, and occasionally he will have reason to be thankful if he has learned how to pack a mule and drive an ambulance team. His miscellaneous knowledge of matters and things entirely outside of his legitimate province will be constantly drawn upon from different sources, and the more he knows and is willing to impart, the more he will be useful and popular. The man who enters the medical department of the army under an impression that he is only expected to treat wounds, set broken bones, and prescribe for the ordinary camp ailments makes a serious mistake and will surely be a disappointment to himself and to those he is expected to serve *

* * * The military surgeon must be a man of vigor, made so by birth and training, with as few requirements in his habits of living as possible, in order that he may resist to

the highest degree the influences of climate and disease, and prepare himself for the hardships and privations incident to active warfare * * * The medical education of a military surgeon must be of the most liberal and broadest kind. His practice is so varied that he may have to be physician, surgeon, oculist, aurist, etc., the same day. The sphere of the regular army surgeon serving at a post includes in addition obstetrics, gynecology and diseases of children. Every military surgeon must be an expert in physical diagnosis and examination of the eye and ear. He must know something about dentistry; he must know how to extract teeth and how to put a temporary filling in a carious tooth that can be saved. He must be familiar with neurology, the use and application of electricity as a diagnostic and therapeutic resource. *

* * * He must be able to apply and make use of his knowledge. * * * Quick decision and prompt action are the essential prerequisites of successful emergency work. Successful action however must be preceded by thoughtful systematic preparation. * * * The nation

worships the heroism of those who fell before Santiago, but much less is said of the vastly greater number stricken down by disease, and who have lost their lives from disease, often after prolonged and intense suffering. To the credit of the medical officers of this and other wars it must be said that they showed no fear, either in facing the enemy or, what is vastly worse, disease. When yellow fever made its appearance among the troops around Santiago, every man remained at his post and faced the danger without flinching. Men from the North who had never seen the disease, accepted the detail for duty in the fever hospitals without a word of complaint. The medical officer must be endowed with more than ordinary courage to face the many dangers that surround him on all sides during a campaign. * * *

It is in war that his ready resources will come to the surface and will be subjected to the severest tests. It is in battle and during the prevalence of devastating diseases that his moral courage and physical endurance will be most severely tried. It is under such circumstances that the troops will reap the greatest bene-

fits from the skill, diligence, fortitude and ready resources of the medical officer."

The chapter upon Gunshot wounds is based upon the lessons of the most recent hostilities. "The evil of meddlesome surgery became very apparent during the brief Cuban campaign, and it has taught us an important lesson that must be heeded in the future. * * * Every change in dressing, more especially in military practice, is attended by risk of infection and must be scrupulously avoided, unless local or general symptoms indicate the existence of complications that demand surgical intervention." With this view of the first dressing, it naturally follows that the author is an earnest advocate of the first aid package, and considerable space is devoted to the discussion of the composition and application of this dressing; he considers the first aid package, of which more than a quarter of a million were distributed to the American troops in the Spanish-American war, to be too bulky and advocates the substitution of his own package, consisting of an antiseptic powder (such as borosalicylic powder), two squares of aseptic lint 4x8 in., a gauze handkerchief 40 inches square, sterilized pins wrapped in tin-foil, and, between this package and the outside impermeable cover, two strips of adhesive plaster, 1 inch wide and 8 inches long. As would be expected from his opinion of the importance of ability to extemporize in a surgeon, he dwells freely upon extemporized methods of dressing, splints, and arterial compression, but by no means to the neglect of the more refined methods. As would be expected, Colonel Senn objects to the use of the bullet probe except in very exceptional cases. He regards the fluoroscope favorably, however, and considers the x-ray an indispensable diagnostic resource to the military surgeon in active service, suggesting that every chief surgeon of an army corps be supplied with a portable apparatus and an expert to use it. He believes that, with the small-calibre bullet "(1) fewer bullets will be found lodged in the body, (2) wounds will resemble more closely incised than contused wounds, (3) range will have more influence in changing the character of the

wound, (4) risk of infection will be diminished, (5) dangerous primary hemorrhage will be more, secondary hemorrhage less, frequent, and (6) the extraction of the bullet will be more difficult."

"The sanguine expectations," he believes, "as to the benefits to be derived from laparotomy on the battlefield have not been realized after ample experience. The only place where such an operation in well-selected cases is advisable and expedient is in the field hospital." The subject of gunshot wounds is further taken up topographically and thoroughly discussed in the light of the latest observations.

His teachings on abdominal and intestinal surgery are so well known that it is sufficient to remark that the statements of the present work are in line with the already well-known views of its distinguished author. Many other features of the book demand mention, for the work is a materialization of the author's own personality. As was said of the *Petit Chirurgie* of Pierre Franco, "it is the author himself, his thoughts, his experience," and as such, it right worthily commands the attention of his compeers.

JAMES EVELYN PILCHER.

THE INTERNATIONAL TEXT BOOK OF SURGERY.

THE two handsome volumes of the Warren-Gould International Textbook of Surgery* are up to date and devoid of verbiage. The unusually high standing of the contributors promised a work of more than ordinary merit, and the expectations are well fulfilled. The articles by Bull, Deaver, Pilcher, Tuholske, Willard, Fowler, DaCosta, Warbasse and McBurney are all worthy of mention, but we are particularly interested in the articles pertaining to military and naval surgery.

The excellent outline of the principles of military surgery by Colonel William H. Forwood of the army, after a review of

*International Text Book of Surgery, by American and British Authors Vols. I, II; pp. 947, 1072. Edited by J. Collins Warren, M.D., L.L.D., and A. Pearce Gould, M.D., F.R.C.S. Philadelphia, W.B. Saunders & Co., 1900.

the subject of projectiles, which includes five interesting tables and several plain and well executed illustrations, the writer vividly describes the conditions of a modern field of battle. After an experience covering more than forty years of active service he says, "Conservative surgery on this part of the field should be a cardinal rule", and "Laparotomy at the ambulance stations will hardly be practicable, or even justifiable," giving as the main reason the often forgotten fact that "such cases require complete rest after operation, which they cannot have on the field." The few pages allotted to the subject of Military Sanitary Organization should be read by every member of the Association. From them one can obtain a non-technical, graphic and authoritative outline of the actual conditions in war, and of the necessity of the three cardinal points—preparation, organization and administration. The value of a study of past campaigns, battles, of terrain, transportation, weather, tactics and the organization and work of other departments is dwelt upon, while under the caption of Service of the Medical Department in the Field is a detailed and vivid picture of march and battle. Space forbids long extracts but the following seems especially pertinent: "Those who expect to go upon the field and pitch their hospital tents in the rear of each brigade and division during a battle will be able to learn much from the study of past campaigns." * * * * "The object of first importance is success in battle. The surgeons, at least two to each regiment and one to a battery, should proceed with the command," and "in some armies one surgeon to each regiment must remain for moral effect with the men under fire." The article closes with a recommendation of a uniform system of identification by means of a small metallic tag, the adoption of which sensible idea would not only identify the dead, but would render valuable assistance to the regimental surgeons in reporting casualties after a fight.

The scholarly article on Naval Surgery by the late Dr. Charles A. Siegfried well illustrates the radical difference between the conditions of the two services. Not only are the

diseases and injuries unlike, but the time of the naval officer is free for work in the line of his professional training, as his manifold duties all bear upon sanitation and the treatment of wounds and disease. The responsibilities of command, of divers property interests, and of the larger administrative positions which prove so important in the military branch, are much less onerous in the navy. The wounds in the latter service are usually made by heavy ordnance, while the interesting table of Colonel Forwood shows that nine out of ten wounds in the army are due to the fire from small arms. The obstacles to the prompt transportation of the wounded aboard ship during action seem almost insurmountable, though twelve per cent of the command are drilled as bearers.

From the nature of the service, a distinction between combatants and non-combatants in a naval battle seems preposterous, and this is the ground taken by the author who makes the point that the so-called non-combatant force below decks is not only exposed with that above to disaster from the enemy's projectiles, but must also face the dangers incident to scalding steam, the ammunition and the various engines of the ship.

The subject of obligatory operation is of interest, and the army rule that a man must submit to minor operations not involving life or limb, when the object is his restoration to duty, should be extended to include the radical cure of hernia.

All military surgeons meet on a common ground when the subject of Hospital Ships is discussed, and the short description of the "Solace" is very interesting. The Relief, Solace, Bay State, and Missouri all proved their *raison d'être* during the war with Spain and it is regretted that we have no hospital ship in our service especially designed and built for that purpose.

The statement that half the naval surgeon's work in some parts of the world is due to venereal disease shows the importance of common sense work for its prevention, and the criticism of an "unwillingness to restrict crews" does not seem well grounded. A thorough and practical weeding out of in-

fected females, and a constant supervision rather than an attempt at repression would rob "some parts of the world" of many of their dangers. The remarks of Colonel Greenleaf at Buffalo anent the far reaching results of these diseases are well worth careful perusal, and the usual policy of ignoring the existence of the cause of the disease is little short of criminal. Dr. Siegfried's whole article is valuable and very interesting.

JOHN STEWART KULP.

FIRST AID IN ILLNESS AND INJURY.*

MAJOR PILCHER'S work on "First Aid," needs no introduction to military surgeons. It has been in general use in the army for a decade, contributing very largely to the high class of work done by the army hospital corps. Immediately upon its publication ten years ago, it was naturally accorded the highest position among works of its class, and, in the successive editions which have followed, it has easily maintained its leadership. And now this seventh edition comes still further improved by additions derived from the practical experience gained in actual warfare during the past three years. At the same time the size of the volume is kept down so that it can be carried in the coat pocket and with its neat green leather binding embellished with the red cross of the Geneva convention it presents a very artistic appearance.

The scope of the work is to provide systematic instruction for the Hospital Corps of the Army and others who may be called upon to care for the wounded or meet medical or surgical emergencies. Part I, under the title of the "Human Machine," gives briefly the general principles of anatomy and physiology, devoting special attention to the

**First Aid in Illness and Injury* comprised in a series of chapters on the human machine, its structure, its implements of repair, and the accidents and emergencies to which it is liable. By JAMES EVELYN PILCHER, M.D., PH. D., Major and Brigade Surgeon of United States Volunteers, Captain in the Medical Department of the United States Army. *Seventh edition revised.* 12 mo. 322 pages, 175 illustrations. New York, Charles Scribner's Sons, 1901.

course of the large vessels and the location of the viscera. Part II entitled "Implements of Repair," speaks of the bacteria and the methods of fighting them; and goes into details about bandaging, splints, slings, and especially the first aid packet and the method of using it.

Part III, "Emergencies and Accidents," which forms the chief portion of the work, deals with accidents and injuries, and includes wounds, hemorrhage, fractures, drowning, freezing, poisons, snake bites, and in fact a complete list of the accidents met with even in time of war. It is needless to say that this part of the work is characterized by accuracy and good sense and is free from the errors so common in works of this kind. In the treatment of hemorrhage, for example, the tourniquet is put in the background and special stress both by text and illustrations is put upon the elevated position of the limb and direct pressure over or into the wound. Methods of handling and transporting the wounded and litter drill for the hospital corps are included in this part.

Part IV, "the Care of the Human Machine," gives directions for the soldier in taking care of himself, and includes directions about food, drink, clothing and cleanliness.

While the work is primarily designed for the instruction of the military service, it is exceedingly well adapted for a much broader field, that of disseminating knowledge along these lines among the laity and is especially useful for those whose vocation renders them liable to be called upon to render assistance in machinery accidents, wrecks, drowning, sun stroke or poisoning.

In the work of the hospital corps of the army, navy or national guard it is absolutely indispensable. No course of instruction is complete without it, and we heartily congratulate the author and publishers upon the general recognition of the fact shown by the call for so many rapidly succeeding editions.

GEORGE REEVES WHITE.

A NEW FRENCH MEDICO-MILITARY JOURNAL.*

OUR new French contemporary shows so much enterprise and originality that we predict for it a prosperous future. The editorial announcement of the first number is as follows:

"Now-a-days when all civilian physicians are connected with the corps of military sanitation, when reserve surgeons are individually striving to familiarize themselves with the special practice which awaits them in case of war, many people of good judgment believe that a journal which would popularize the work of military surgeons and physicians of different countries, could not only be successfully published but would also become a necessity.

"Our old comrades, and several of our professors, led doubtless by the individuality of our specialty, have persuaded us to this enterprise by promising us not only their support, but their most devoted aid.

"Under such circumstances the decision was easily made and we are today presenting the medical public with *Le Caducée*; a journal of army surgery and medicine. The design, and the path we shall follow are outlined in the ensuing prospectus, which will be faithfully carried out.

"Army surgery and medicine are ruled by principles, which are just as binding on military surgeons, as are those which govern the navy or the colonial service, and this is true of both the active list and the reserve. For the furtherance of scientific unity a publication which will bring together the work of military surgeons—army, navy and colonial service—both of France and foreign countries, will answer a real necessity and this is the aim of *Le Caducée*.

"The name itself calling up as it does the most ancient symbol of medicine, and also the insignia adopted by military surgeons, is a guarantee of fraternal union, of scientific tradition.

La Caducée far from competing with its elders, the official publications, proposes only to bring out the wealth which is now accumulating out of the sight of the medical public. It will not be a rival but an ally, and in some respects a supplement.

**Le Caducée*, Journal de Chirurgie et de Médecine d'Armée,—Guerre—Marine—Colonies. Rédacteur en chef. M. le Dr. GRANJUX. Secrétaire de la Rédaction, M. le Dr. ED. LAVAL. M. Léon, 9 Rue Jacob, Paris.

"We may add that we shall treat scientific subjects only. No criticism of military authorities will be made, nor will personalities be permitted. On the other hand our columns are open to all workers in the military field.

"Our program therefore being definitely outlined, here is what we expect to realize: *Le Caducée* will be published every fifteen days, the first and third Saturdays of the month. It will contain original articles, general reviews, a synopsis of the French and foreign press, medico-surgical studies of war, and finally a special bibliography of news. This is a large program but we shall undertake it fearlessly, trusting to the friendly support, in France and foreign countries, of the men who do honor to military surgery and medicine."

Le Caducée is a 16-page paper, 24x32 cm., four pages of which are devoted to advertisements. The later numbers are well up to the standard of the first, some of the photographic reproductions being especially good, and we are glad to welcome it as a co-worker in our own field. JOHN STEWART KULP.

NEW BOOKS ON FIRST AID.*

THE growing importance of the study of first aid is indicated by the increasing number of manuals for the enlightenment of students of the subject. The two latest come to us from England, and are excellent examples of the two types of such works,—the complete text book and the concise manual. There is much that is admirable in the little isogogue of Drinkwater, the illustrations being particularly good and mainly half tones from photographs. He gives a new diagram of the circulation which is particularly good. The instructions are clearly couched in pleasant conversational phraseology and are clearly and attractively expressed. The chapter on transportation is weak, however, and omits

*First Aid to the Injured and Ambulance Drill. By H. DRINKWATER, M. D., 24 mo. pp. 104. 74 illustrations. London, J. M. Dent & Co., 1901.

First Aid to the Injured and Sick. By F. J. WARWICK, B. A., M. B. Cantab., Surgeon-Captain, Volunteer Medical Staff Corps, and A. C. Tunstall, M. D., F. R. C. S. Ed., Surgeon-Captain Commanding the East London Volunteer Brigade Bearer Company. 16 mo. 232 pages. 154 illustrations. Philadelphia and London: W. B. Saunders & Co., 1901.

some of the most desirable methods, while including others that would be of more advantage were they absent.

The work of Warwick and Tunstall is more pretentious and presents the subject in two parts, one of 64 pages,—consisting of an outline of human anatomy and physiology,—the other of 142 pages,—containing the practical applications of first aid. The former section is rather more elaborate than is desired by most students, although not too much for others. This would have been well expressed, had the more essential facts been stated in one size of type and the more detailed information in another. Many new cuts add much to the excellent qualities of this section. The second part contains an exceedingly full and exhaustive discussion of bandaging and a complete and comprehensive treatment of hemorrhage, while fractures are amply considered pathologically as well as therapeutically. The tabular form of treating of hemorrhage, poisoning and bandaging is adopted with excellent effect, rendering reference easy on the part of the student. Transportation is minutely discussed but is rather out of date from the American standpoint, although the methods of carrying the injured are, as in Dr. Drinkwater's manual, feasible and useful. The methods of using the litter are those of the British army. The small print of the work renders it possible to compress a large amount of information within its very handsome covers, although it is attended by the resultant disadvantage of making it a little difficult to read. The book is a distinct advance on former candidates for the favor of British ambulance classes and is worthy of wide circulation.

JAMES EVELYN PILCHER.

NEW CONTRIBUTIONS TO THE LITERATURE OF FRACTURES.

SINCE the publication of Samuel D. Gross' work on the Anatomy, Physiology and Diseases of the Bones and Joints in 1830, numerous books upon fractures have accumulated to the credit of American Surgery. The recent treat-

ises of Scudder and of Beck worthily find a place among the most valuable of the collection.

The most pleasant task the writer has undertaken for a long time, is that of reviewing the admirable text of Scudder.* As a general practitioner he has seriously felt the need of such a volume as a reference many times in the past. Every page is replete with information, valuable alike to the beginner, and to the experienced surgeon. The author has illustrated the text with numerous X-ray tracings showing the actual condition of the fractured bones and their relations to the surrounding soft parts. The information thus derived is applied in a scientific manner, and the treatment of many fractures greatly simplified. Many of the 608 illustrations are devoted to showing the best method of examination for the detection of the fracture, and how to apply the required dressings. A special feature is the statement of indications for operative interference, given under the appropriate heading in each case where it may be required.

While all parts of the book are equally meritorious, special attention is called to the following group of fractures. The subject of fracture of the skull is dealt with in a masterly manner and includes a description of the method by which they are produced, the special symptoms that may develop, the complications and sequelae that may ensue, and the indications for operative treatment in each case in detail; at the end of the chapter illustrative cases are given. In connection with fractures of the vertebrae the lesions following injury to specific vertebrae are presented in detail, and are shown by diagrams, as are also the lesions produced in the cord by the injury. In discussing the pelvis, lesions of the abdominal viscera, as well as the urethra and bladder receive attention and the necessary operations are considered.

Fractures of the humerus are delineated with particular clearness by the X-ray tracings, in different positions, and

***The Treatment of Fractures.** By CHAS. L. SCUDDER, M. D., Assistant in Clinical and Operative Surgery, Harvard Medical School. *Second edition, revised and enlarged.* roy 8o p.p. 433, 608 illustrations. Philadelphia and London: W. B. SAUNDERS & CO., 1901.

the means by which they are produced illustrated. Special attention is given to the treatment of solutions of continuity near the elbow, with and without splints, and careful instructions how to preserve the carrying angle and the function of flexion are not wanting.

Colles' fracture with its anatomy and differential diagnosis receives very careful consideration. Illustrations of the deformity are given, X-ray tracings of the different forms of the fracture are used as well as skiagraphs to elucidate the text. The author, however, fails to recognize the essential pathological element in the displacement of fracture of the lower end of the radius, as classically demonstrated in Vol. VII of the Proceedings of this Association. The methods used to reduce the fracture are shown and attention directed to special points in the illustrations to facilitate reduction, while attention is directed to the methods of treatment required by the various forms of the lesion in the illustrations together with the manner of application. The chapter on fracture of the hip and femur is very interesting and contains much that is new and valuable; special attention is called to treatment of fracture of the femur in children.

In connection with treatment of fractures of the patella, after describing the relative dressings it is advised that operation should be undertaken only by surgeons of judgment and great skill, who have at command skilled assistants, and who can work under the most rigid aseptic conditions. A chapter, devoted to plaster of paris dressings, consists mostly of illustrations. The book concludes with a chapter upon the ambulatory treatment of fractures in which the arguments for and against this method are carefully considered.

The discovery of the Röntgen rays has contributed to the treatment of fractures an impetus almost impossible for the student of the last few years to realize. A comparison of the interesting work of Dr. Beck* with one published prior to the discovery of the X-ray is like comparing the achieve-

*Fractures. By CARL BECK, M.D., with an appendix on the practical use of the Röntgen rays. roy 8^o pp. 335. 178 illustrations. Philadelphia, W.B. Saunders & Company, 1901.

ments of ancient and modern history. As an exponent of the use of the X-ray in the treatment of fractures this work is an admirable guide. The majority of the illustrations are from skiagraphic plates of the different bones at the point of fracture illustrating the deformity existing. The contents are condensed under: an introduction; fractures in general; fractures of special regions; and the appendix.

The introduction is devoted to the consideration of the different facts in electricity leading up to the discovery of the Röntgen rays and "the special uses of the rays in diagnosing the various types of fractures." Under fractures in general, the classification, symptoms, diagnosis, the process and the disturbance of the process of repair, and treatment in general are considered. A feature of the book that seems superfluous, and that might be well omitted, is the details on aseptic surgery. This is treated fully in all modern textbooks of surgery, and especially in the author's manual on Asepsis. The author's treatment by moss splints is described in connection with fractures of the clavicle and compound fractures and its desirability urged. The book is a valuable acquisition to the scientific consideration of fractures, and the many points of excellence will well repay the reader for a careful and detailed perusal.

A. R. ALLEN.

SOME IMPORTANT MEDICO-MILITARY PAMPHLETS

IN ADDITION to the annual reports of the Surgeon Generals of the various services and the reprints of memoirs which have appeared in the JOURNAL, a number of pamphlets* of medico-military interest have recently been issued from the press. Among these should be mentioned, as especially worthy of notice, the instructive papers of Colonel Alden upon the climate and diseases of Porto Rico and the personal identification system with which he has been so intimately associated during his prolonged tour of duty at the War De-

*Colonel Charles H. Alden, U.S. Army., Puerto Rico; its climate and its diseases. 12 mo. pp. 20.

Ibid. The U. S. Army System of Personal Identification. 12 mo. pp. 18.

Major Angel de Larra y Cerezo, Les services sanitaires d'Espagne en Afrique. 12 mo. pp. 13.

Ibid. The Official Hygienic and Sanitary Institutions in Spain. roy. 8vo, pp. 6.

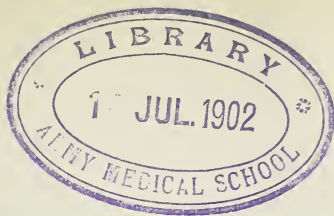
Rear Admiral Presley M. Rixey, Medical and Surgical Report of the Case of the late President of the United States, 8vo. pp. 24.

partment. A couple of papers by the distinguished editor of *La Medicina Militar Española* upon Spanish sanitary organization at home and in Africa are most valuable, and will be treated in abstract hereafter. The detailed report of the case of the late President McKinley, by Admiral Rixey, who was his attending physician, is a model report of a case, which, because of the high station of its subject will always command attention and which will happily always be free from criticism of inadequate scientific description. JAMES EVELYN PILCHER.

THE REJUVENATION OF HEATH.

HEATH'S Minor Surgery* has held the favorable regard of the profession for so many years that a new edition, modified in accordance with the advances made in surgery during recent times, comes with pleasurable emotions to the attention of the medical officer of the *commencement de siècle*. In its earlier days, occupying a place upon the army Supply Table, it has been of exceeding service in the training of a host of young military surgeons. The present edition, unavoidably somewhat larger than earlier ones, is still judiciously condensed into convenient limits and the revisions and additions of Mr. Pollard have been made with marked judgment and discrimination. The chapter on Bandaging is selective rather than comprehensive in character, many forms of bandaging ordinarily described being omitted; it seems odd, for example, to a military surgeon to find no full description of the triangular bandage and its multiple applications. The first aid dressing packet, so important an adjunct to the work of the military medical officer, is also conspicuous by its absence. Sterilization and the manner of attaining and maintaining asepsis by modern methods receive ample attention, anaesthesia is considered in the light of the most approved practice, the minor operations are instructively described, and the book is so brought up to date as to amply continue its work of prompting and befriending successive generations of surgical youth. JAMES EVELYN PILCHER.

***A Manual of Minor Surgery and Bandaging.** For the use of House Surgeons, Dressers and Junior Practitioners. By CHRISTOPHER HEATH, F.R.C.S., LL.D. Twelfth edition. Revised by BILTON POLLARD, F.R.C.S. 12 mo, pp, 426, 195 illustrations. Philadelphia, P. Blakiston's Son & Co., 1901.



A BRIEF SKETCH OF THE ORIGIN AND HISTORY OF THE MEDICAL CORPS OF THE UNITED STATES NAVY.

By CAPTAIN GEORGE PERLEY BRADLEY,

MEDICAL DIRECTOR, UNITED STATES NAVY.

IT IS the purpose of this paper to sketch, as briefly as the time and space allotted demand, the history of the origin and development of the Medical Corps of the United States Navy; to trace its slow and gradual progress from a few surgeons and surgeon's mates, employed like other officers only on such armed vessels as could be hastily collected, for strictly professional duties afloat, and discharged when their ships were out of commission, to the present thoroughly organized and equipped body, with a centralized administration, controlled as far as the general discipline of the Navy permits, by a senior member of its own force, and with functions embracing every portion of the healing art. The requirements of this art, constantly enlarging, must be met and complied with in military service, often at a great disadvantage; for, whereas the tendency in the profession at large, with the increasing number of branches correlative with the practice of medicine and surgery, is towards specialism and division of work, the military or naval surgeon is obliged to have at least a respectable working knowledge of all; must be his own hygienic expert, analyst, bacteriologist, etc., besides being what is commonly termed a general practitioner in the largest sense of that term. Very many of these branches were unthought of even a generation or two ago, and though it has long been recognized that the most really important practical duties of a naval medical officer are those tending to the prevention of disease rather than to its treatment, i. e. hygiene

and sanitation, yet this elementary notion has needed a long time and many efforts to secure practical adoption and enforcement, while the details making up these sciences are constantly changing and advancing.

The Country Doctor (*"clarum et venerabile nomen"*) was not so often thrown upon his own resources under unfavorable conditions as was the naval surgeon, even in former times, when the scope and range of the duties of the practitioner were so much more limited. Especially, he was less often called on to judge and decide, sometimes very quickly, questions which involved the fate of a large ship's company by the entrance or non-entrance of an infectious disease. These matters are adverted to but briefly in this introduction, to point out the extreme importance of that settled centralized organization now to a great extent at least secured and confirmed by law, almost unknown in the earlier years of the Corps, without which, and the discipline necessarily attendant, the accomplishment of the manifold duties of a medical officer, particularly at sea, from being merely difficult would become impossible. It may also be noted here that the increased time now needed for a young man to acquire the rudiments of a modern professional education is recognized by an increase of the age limit of candidates to thirty years instead of the twenty-six formerly prescribed—a benefit not only to the candidate but to the corps and to the service of the country which is always to be primarily considered.

To trace the successive steps by which this present organization was legally secured will be the main purpose of this sketch, with some reference to the writings and efforts of the men who aided therein, or who otherwise have done honor to their corps and profession by services in war and in peace, oftentimes, as will be seen, "no less renowned" by unselfish heroism and daring in the latter than in the former.

In the first period of our history, from the beginning of the Revolution to 1789, there is even less to be found (on any superficial examination) relating to medical officers than might be supposed. Indeed one may look through most of the standard

works on naval history anywhere at a later date, and find no more reference to such officers than as if they had been non-existent. But in fact there is little, save descriptions of bloody actions at sea, and their dates, in most of them: how the ships were equipped (save as to battery); what, if any, precautions were used to preserve the men in health; the diet; the many things which contribute to enabling one vessel to keep the sea, and to forcing another to struggle into port unfit for service, were not usually regarded as in keeping with the "dignity of history." Yet it is apparent that even then, or at any rate a few years later, some commanders like Decatur, Rodgers, and David Porter (of "Essex" fame) appreciated the bearing of such questions and used all efforts to settle them. In the earlier days almost every armed vessel, even pirates, had a surgeon of some kind, and with the first ships commissioned by the Continental Congress provision was made for surgeons and their mates, in number according to the number and size of the vessels.

The first order looking to the establishment of a national Navy was given by General Washington in the latter part of 1775, when he commissioned Captain Nicholson Broughton with two armed schooners belonging to the colony of Massachusetts, for the special service of capturing certain vessels containing supplies of war. Captain Broughton brought in ten prizes, (though not those desired).

The first real naval armament ordered by the Continental Congress, in October 1775, comprized a number of small armed vessels, which performed the first service under strictly national authority. By the end of that year (December 13, 1775), thirteen vessels of war had been authorized, apportioned to the colonies of New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, and Maryland. Rules and regulations of the Navy had already (November 28, 1775) been enacted, and these, adopted with their modifications and approved in 1800, form the basis of the present "Articles." Surgeons and surgeon's mates, the former commissioned officers, the latter warranted, were specified in cer-

tain fixed number to each vessel, and (Act of January 6, 1776) their shares of prize money were allotted. The importance of prize money at this period will be apparent by reference to the earliest pay-tables, where the pay of the surgeon of a small vessel (under 20 guns) was the magnificent sum of \$21 $\frac{1}{3}$ per month; of the larger class \$25.00; of their mates \$13 $\frac{1}{3}$ and \$15.00 respectively. This was not disproportionate to the pay of other officers, and it is evident that the emolument of all was dependent on the plunder rather than on the stipend, as may be inferred by the very careful allotment of the former prescribed in various acts of Congress from the earliest times up to very recently, when prize money was finally abolished, subsequent to the war with Spain. There was also a bounty (by act of November 15, 1776) of \$20.00 per gun of prizes, and of \$8.00 per man of the hostile force, to be distributed in the same ratio with prize money.

It is a pity that the medical officers of the Navy did not possess, then or subsequently, a Smollett, who could have bequeathed to us such a word-painting of the American ship as did the great English author of his own vessel; it would be interesting to note how far, if at all, there had been an advance made from the absolute barbarism of 1730 to 1780; if we may judge by the very slow improvement from the later period up to 1850, when flogging was forbidden, and to 1862, when the grog ration was abolished, there must have been little of civilization. But we are not able to trace more than a few facts in regard to our medical ancestors of the Revolutionary Navy. It would appear that surgeons and their mates were at first employed like other officers, in definite number, for service on such vessels as could be fitted out, with commission or warrant from the "Marine Committee" or their substitutes, and simply for the purpose of attending to the wounded and sick; that when the ship was laid up or destroyed, their employment ceased. Cooper, in his "Naval History" remarks of the Revolutionary Navy, "After the first effort connected with its creation, the business of repairing losses, of increasing the force, and of perfecting that which

had been so hastily commenced, however, was either totally neglected or carried on in a manner so desultory and inefficient as soon to leave very little of method or order in the Marine. As a consequence officers were constantly compelled to seek employment in private armed ships, or to remain idle," etc. It would be difficult, if not impossible, even to approximate the number of medical officers employed in any one year, depending as it did on that of vessels actually in service.

In 1777 an act was passed prescribing that no surgeon or mate could be commissioned or warranted without a favorable certificate of examination from at least one examiner appointed for this purpose, indicating that even this qualification had not been necessary before. The pay and allowances of surgeons were also equalized with those of lieutenants according to the class of ships on which they were serving. (\$25.00 instead of \$21 $\frac{1}{3}$, etc.).

The only provision for shore pay or subsistence appears in an act of 1775, allowing all officers \$4.00 a week for "board" when their ships were not in a state to receive them.

At the close of the Revolutionary War, and indeed for several years subsequent to 1789, there was no Navy. The last vessel remaining, the "Alliance," had been sold in 1785, and though in 1789 the President was declared commander-in-chief of the Army and Navy, with power of appointment of officers, subject to confirmation subsequently by the Senate, no steps were taken to acquire vessels till 1794, when the Algerine piracies caused the passage of an act authorizing the provision of four vessels of 44 guns and two of 36 guns, with specific allowance of officers and men to each. The former class were entitled to one surgeon and two mates, the latter to one surgeon and one mate. It also fixed the pay of these officers at \$50 and \$30 per month respectively, and two rations (of about twenty cents each) per diem. It also prescribed the ration itself. Although this act was for a temporary purpose and soon became obsolete by the cessation of hostilities, it laid the foundation of the present Navy, and for many years its provisions were unchanged. Pay and rations of medical

officers remained unchanged until 1828. A similar act specifying the three frigates "Constitution," "Constellation," and "United States" for service was passed in 1797, with a section prescribing that officers and men should be governed by the rules of November 28, 1775 "so far as the same may be applicable to the constitution and laws of the United States," and, as already stated, these were practically adopted in the act of April 1800. This act also was limited to a year's duration; but in 1798, April 30, the Navy was finally established on a more permanent basis by the creation of the office of Secretary of the Navy, the Secretary of War having hitherto administered the duties. As regards the Medical Corps, surgeon's mates are now commissioned; there had been no change in the nature or scope of their duties, nor was there for some years, but at least they were regularly and to some extent permanently employed, they were protected by a commission at entrance, and before many years the increasing needs of the regular naval establishment and increasing scientific knowledge were to lead to the formation of a hospital system, a system of physical examination of recruits, allowance tables and other details necessary to an organized service. The number of medical officers varied according to the supposed exigencies of the moment. After the termination of the French hostilities various acts of Congress, beginning with 1801 and modified or amended during the next few years, provided for a "Naval Peace Establishment." The first, (March 3, 1801) ordered the sale of all vessels except thirteen, specified by name, of which six were to be kept officered and manned (with a reduced complement of seamen), the remainder to be laid up with a small detail to care for them. The President was authorized to discharge all officers except a certain number specified by name, of Captains, Lieutenants and Midshipmen. Of officers he thought proper to retain, only those actively employed were on full pay; the rest were on half pay only, as was then and long afterwards customary. In the absence of any lists, excepting those of the commissioned line officers, we can only conjecture that the surgeons and

mates were proportionately affected with them; but it is plain that the reduction was not so great as has been generally supposed, and the ensuing war with Tripoli which continued four years, must have secured employment to many if not most of the existing number. It may be of interest to mention that three medical officers were captured in the "Philadelphia" in 1802, and that one (Dr. Herman) shared in the dangers of Decatur's exploit, on the ketch "Intrepid," when that frigate was destroyed, February 16, 1804.

The history of the Naval Hospitals of the United States, the first "shore duty" of the Corps, is rather curious. Prior to 1811 (act of February 26) there was no attempt to establish them as separate institutions: in 1798 (act of July 16) marine hospitals for the merchant navy had been so established, and the sum of twenty cents per month was deducted from the wages of the seamen. The next year this act was so amended as to apply to the Navy, the same deduction from the pay of "officers, seamen and marines" authorized, to be paid quarterly to the Secretary of the Treasury, and the same "benefits and advantages" of the hospitals to accrue to them as to the merchant sailors. The inconveniences of this divided control might have been foreseen. In 1810 (February 22) Secretary of the Navy Paul Hamilton, in a letter to the chairman of the House Naval Committee, states: "The amount thus deducted [i. e. the twenty cents per month] paid into the Treasury, is \$55,649.27, and there is a considerable sum deducted but not yet paid into the Treasury: and yet no Navy officer and but very few of the Navy seamen have received any benefit from it. * * * * * The inconveniences and embarrassments which arise from the placing of persons engaged under military laws in the public service in hospitals where no such laws exist have escaped the attention of Congress.

"In the few cases which have existed of any seamen being sent to such hospitals, experience has proved that the commanding officers of the ships from which they were sent would never get returns made to them, and that on an average three out of five have deserted as soon as they get into a con-

valescent state. Hence the propriety of having distinct establishments for the relief of sick officers, seamen and marines of the Navy." He proposes many methods of securing income besides the tax on pay already in force.

In 1811 then, (act of February 26) this separation was effected. Fifty thousand dollars were to be taken from the general fund, that amount being considered due from the unused tax of the Navy; in addition, as a means of support, all fines imposed on officers, seamen and marines and the value of stopped rations, with of course the continuance of the twenty cents per month deduction. It was authorized that suitable grounds and buildings should be acquired by purchase or construction, and in particular that one of these establishments should "provide a permanent asylum for disabled and decrepit navy officers, seamen and marines."

Unfortunately a "board of commissioners" was also provided, consisting of the Secretaries of the Navy, Treasury and War, to administer this act. Practically nothing was done from this time until 1830 or later in the way of the permanent establishments contemplated. The ensuing war of 1812 diverted the fund into other channels, and it was "absorbed" into the pay of the navy. It was not till 1827 that the principal, now amounting to more than \$120,000, was repaid (after an unsuccessful attempt in the Senate to again combine naval and merchant marine hospitals) and the interest due was not paid till 1829. What the condition of the nominally-existing hospitals of the navy was meanwhile (and for several years later still) we may learn from the records of the medical officers, through whose efforts this great reform had been instituted, and, as they hoped, accomplished. Inasmuch as after the act of 1811, the sick of the navy had to be provided for by the navy, the different navy yards then for the first time becoming of some importance, had to supply "temporary" accommodation. At Philadelphia, for example, there was a "hovel" in the old yard on the Delaware, destitute of every comfort, fit for eight patients but containing twenty-four and "the thought of each was simply to gather strength enough to desert." (1813).

In that year a "temporary" frame building was erected in place of the "hovel," which however had to be used till 1826, when the site of the naval "Asylum," so termed up to 1889, when it was renamed "Home," was purchased, the buildings already existing there serving as a hospital as well as for the few beneficiaries, until more suitable structures were erected—the present hospital not until 1868. At Washington and other places very similar accommodations existed.

Space does not allow of a full account of existing hospitals, for which we may refer to the pamphlet by Surgeon J. D. Gatewood of the Navy, entitled "Notes on Naval Hospitals, medical schools and training schools for nurses, with a sketch of hospital history," (1893) from which the greater part of these facts are taken. It will suffice to mention the dates of construction of the more important ones, premising that most have been quite recently remodeled or rebuilt, and equipped in accordance with modern ideas.

As has been said, nothing was done practically to carry into effect the act of 1811, beyond the purchase of a few sites, for many years. In 1832 an act of congress invested the Secretary of the Navy alone with the powers of the Commission composed before of the three Secretaries, stations were designated for the construction of hospitals, and thus, usually very slowly and with frequent delays owing to scarcity of funds, the following hospitals arose and may be assigned dates:

At Portsmouth, N. H., though the navy yard was established soon after 1800, there was no local provision for the sick till 1834, when a vacant frame building holding ten patients (enlarged to a capacity of twenty-five in 1865) was allotted. The building on Seavey's Island was erected in 1891.

Boston, Mass., (Chelsea) 1836.—Residence of Senior Medical Officer, 1857.

New York (Brooklyn).—Land first acquired in 1824, and patients treated in the original house and farm buildings; the permanent hospital erected 1838-40.

Philadelphia.—As already stated the present hospital building was not commenced until 1868. Before that time

the "Asylum" or "Home" was occupied as such, which itself was not completed before 1848.

Washington.—More than the usual makeshifts existed here till 1866, when the hospital now in use was erected. At first a building was rented near the navy-yard, then one was employed in the yard till 1843. Then there were successive removals to the marine barracks, and even to the Government Hospital for the Insane.

Annapolis, Md.—The Naval Academy was established here in 1845. A hospital to take the place of a small frame structure near the fort was built in 1853 and enlarged on various occasions since.

Norfolk, Va.—After 1811 quarters for sick were established in the navy-yard which appear to have been in all respects like the "hovel" in Philadelphia. The building of the edifice now situated in its fine grounds went on for many years after 1832, although the different wards and wings were occupied as completed from 1830.

Pensacola, Fla.—This yard, an important one before the war, was to a great extent destroyed then, and the hospital has since consisted of temporary frame buildings.

Mare Island, Cal.—The first permanent building (succeeding the usual "hovels") was in 1870. It was pulled down and rebuilt in wood after the earthquake of 1898.

Yokohama, Japan.—Built in 1872 and recently much enlarged and refitted.

Of late indeed, and especially since the Spanish War, much has been done in the way of erecting new hospitals, permanent and temporary, as well as of enlarging and refurnishing the old. At Newport, R. I., for infectious diseases; Port Royal, S. C.; Sitka, Alaska; Cavite, Philippines; for emergency, at Taku and Tientsin, China; at Olongapo Philippines, etc. A striking defect is still the lack of a separate institution for the treatment and care of the insane, there being but one Government hospital (for all branches and under civil control) in the East, and none at all on the Pacific coast where one is greatly needed.



The formation of naval hospitals has been rapidly traced because it marks the real origin of that "shore duty," which, under the demands of sanitary and hygienic science, is always assuming more relative importance. It is certain that the medical officers of 1811 who urged this reform were as well aware of the value of that science as we are today. In 1814 Dr. W. P. C. Barton, who entered the service in 1809, who was subsequently the first chief of the Bureau of Medicine and Surgery, in 1842, on the adoption of the Bureau system, and who died in 1856, published a work on naval hospitals and "a scheme for amending and systematizing the medical department of the Navy," which marks an epoch in the history of the Corps. It is evident that he supplied Mr. Hamilton with the material for his letter quoted above on the necessity for distinct hospitals for the Navy; and a large part of his book was taken up with the practical work of administration of such hospitals in every detail. It may be observed in passing that he usually employed the term "Marine Hospitals" when he evidently refers to naval ones, the more technical use of the words and the distinction involved being then of recent date.

His system is most elaborate, and though of necessity rendered obsolete now by the changes in hospital construction and modern improvements in almost every branch of domestic economy, it shows a capable and organizing mind. But of greater interest are his remarks on the conditions of the service generally from the standpoint of the surgeon, and the light he throws, sometimes by implication only, as it were, on the methods, customs, and abuses of that period. It appears that the mode of supplying the medical outfit left much to be desired; there were no regular allowance tables proportioned to the complement of a vessel. When Barton, still very young, entered the service, he was appointed surgeon at once and was ordered to one of the largest vessels, the "United States," with a complement of 430 men. "I soon found myself" he says "not a little embarrassed by the perplexities that I daily met with in my practice on board. The unhealth-

iness of the climate operating upon a variety of different constitutions in an entirely new crew; the change of diet and mode of life; the necessary and unavoidable exposure of boats' crews to the fervid rays of a vertical sun, as well as to the damp and heavy dews of night, and at all times to the insalubrious exhalations of marsh miasma, all combined to generate such perpetual sickness that the frigate might almost have been called a hospital-ship, the average number on the daily sick list of fevers and fluxes, being about 40. In this situation, on board of a ship just refitted, commissioned and equipped, I found myself without half the comforts and necessities for the sick that the hospital department should have been supplied with; yet this department had been reported as replenished with every requisite article for a cruise of two years, and together with the medicine-chest had cost the Government fifteen hundred dollars. There were neither beds for the sick, sheets, pillows, pillow-cases, nor night-caps; nor was there a sufficiency of wine, brandy, chocolate or sugar, and that portion which the storeroom contained of those articles was neither pure nor fit for sick men. The medicine-chest was overloaded with the useful and choked up with many useless and damaged articles. That was the state of the medical department of this ship. Upon a representation of it, however, to her commander, Commodore Decatur, he generously allowed me all the necessities I stood in need of, and thus enabled me to administer those comforts to my patients which they so much required. * * * * * The other ships were not better furnished than the one of which I am speaking, and I perpetually heard of complaints on this score.

"What was the cause of these abuses? The want of a regular board of medical commissioners whose peculiar province it should be to order the proper proportions and quantities of medicines, comforts and necessities for the public ships, and who should have no interest, directly or indirectly, individually or collectively, in the furnishing of articles thus ordered."

It appears that medicines might be, and doubtless often were, sent to ships by the apothecaries who supplied them, in such quantity and of such kind as they pleased. It is easy to see how abuses might exist, and it was doubtless due in a great degree to Dr. Barton and other surgeons that they were soon after corrected.

Besides this chief abuse, Dr. Barton enumerates others. He speaks of his attempt to have "the lemon juice" introduced "in abundant quantities," "into free and liberal use in our ships." He speaks of the faultiness of the regulations respecting the responsibility of the surgeon for the safe keeping and proper appropriation of the articles entrusted to his charge exclusively for the benefit of the sick. He desires the "alteration of the present ration, or at least the liquid part of it;" the better ventilation and warming of our ships in the winter season; he, like every other surgeon of generations before and after, denounces "the practice of wet scrubbing the decks in cold and damp weather," and lastly, the "impropriety and pernicious consequences to the service of the present plan of recruiting, in which men are shipped without a strict examination by a professional man." He expects opposition as an "innovator," but appeals to Commodore Decatur, Captain Porter and Commodore Rodgers for support, and is grateful to enthusiasm for their aid in the past. He speaks not without feeling, of having been put on the half-pay list owing to his efforts for reform and makes a strong plea for promotion by seniority, indicating that "selection" was not even in those days supposed to be free from abuse.

He proposes that his "board of medical commissioners," who are to have the furnishing of the medical outfit, should also be a board of examiners of candidates for the appointment of surgeons and surgeon's mates, and a person should never be commissioned in the Navy until he had passed this board: though he adds rather curiously in a note, "Graduates in medicine should be excepted from this examination, unless there is reason to believe they have received their degree by favor."

He proposes and furnishes very complete allowance tables of all sorts for medicines, diet, hospital supplies, etc., and it is probable that many of these were practically adopted later. His remarks on the indiscriminate wetting of decks are as severe as just, and he adds "yet I was never able to convince any one of the sea officers with whom I conversed on this subject of the injury resulting from this custom."

It would appear from one of his chapters that a singular practice was then existent in the Navy, viz: that it was customary for the surgeon of a ship or hospital to receive from the purser attached thereto a fee or remuneration for each man with venereal disease whom he attended, this fee, which seems to have been five dollars, being of course charged against the unfortunate man so affected. Of course there was never the slightest authority of law or even of navy rules for this imposition; but the men did not know this, or perhaps as the author suggests, the "generous hearted tar" did not wish to incur his superior's displeasure. It is said that this practice was copied, like most of ours, from the English service, in which, however, it had been for some time disused, and a fixed compensation was allowed the surgeon by his Government. It probably did not long continue in our own Navy after this period.

We have adverted at some length to this publication because Dr. Barton was in some respects the pioneer and advocate in print of many reforms, some of which he was able to effect during his long life in the service.

In 1815 (act of February 7) an important change was made in the government of the navy by the appointment of a board of commissioners to consist of three senior line officers, who were empowered (always under the control of the Secretary) to prepare rules and regulations (the foundation of the present "Blue-Book") and generally to discharge the "ministerial duties of said office, relative to the procurement of naval stores and materials," etc. This was a revival of a similar board "of Admiralty" established by the Continental Congress in 1779 (October 28) but then consisting of "three

commissioners, not members of Congress, and two members of Congress, any three of whom to form a board for the dispatch of business; to be subject in all cases, to the control of Congress." This system lasted until 1842.

In 1807, when a general increase of pay for officers was recommended, it was observed in a letter to Congress by Robert Smith, Secretary of the Navy, that medical officers "received less than the usual profits of the private practice of physicians on shore." An elaborate estimate of the pay and allowances (rations) shows that surgeons received \$746.00 annually; surgeon's mates \$506.00. Officers unemployed were on half pay, without rations, and had to hold themselves in readiness for orders, while those on furlough were free from this disadvantage.

In 1812 the number of surgeons was 26, (three of whom were on half pay) of mates 26, with two on half pay; in 1815 (when a maximum may be assumed) 47 surgeons and 66 mates; in 1820 surgeons 47, mates 34; in 1825 surgeons 34, mates 40.

In 1818 there appeared a code of rules and regulations for the Navy, revised by the recently appointed commissioners, which defined the duties of all officers and in which we can trace the influence of Barton's suggestions of 1814, so far as careful instructions regarding care of sick, of stores, system of accounts, etc., go; allowance tables, forms of requisitions, receipts and reports similar to those of the present day were prescribed. But the commanding officer was directly charged with all sanitary and hygienic precautions (with apparently the solitary exception of lime juice) and might neglect or carry them out as he chose. A pecuniary responsibility for his outfit and supplies was fixed on the surgeon, who on reporting to a ship took possession of them and receipted to a Medical Purveyor or other agent, to whom he turned them over at the end of a cruise, or, in his absence, to the surgeon of the hospital or navy yard at the station where the vessel was laid up. He is allowed a "permanent attendant" or "lob-lolly boy," could stop rations of sick (more important than

than now with our modern ration), and is to report on the efficiency of his mates or assistants (who performed the duties of apothecaries), etc.

The nursing of the sick was customarily done by the enlisted man's mess-mates, and such other assistants as the surgeon needed or could get. The sick quarters then, as always, were undefined and unsatisfactory generally. A fleet-surgeon was also provided for and his duties defined. It is worth remarking also that even then a hospital ship for each squadron was contemplated but was to have no practical existence for many years later.

In 1828 (Act of May 24) the very important change was made that no one should be appointed assistant surgeon (the first *legal* notice of change of title from "surgeon's mate") without examination by a board of naval surgeons, and, equally important, that commissions to the higher grade should only be issued by promotion from the lower after service of at least two years at sea and passing of examination as before. Fleet-surgeons were also established, their duties defined and some addition made to the pay of the medical officers, according to longevity.

This was perhaps the most important legislation affecting the Medical Corps up to this time, and laid the foundation of its organization. Henceforward no appointments from civil life to the higher grade could be made, and it needed only the substitution of the Bureau system, in 1842, for the "Admiralty" of three line officers, to establish a center of administration and an *esprit de corps*. Almost all the administrative methods advocated by Barton had been carried into effect by regulation or law; and it may be remarked that the principles of improved naval hygiene and sanitation were now zealously, though generally unsuccessfully, inculcated both in writing and in practice by the surgeons of the Navy. It seems incredible now how dear the wet berth deck, "from a mistaken idea of cleanliness," as Barton indignantly says, was to the "sea officer." In fact it was never willingly given up until within the last few years modern construction made it almost

impossible. It is hard to estimate the real difficulties of ship sanitation in "old times," *i. e.* even twenty years ago, without the aid of personal recollection; it is not an exaggeration to say that the wooden auxillary-steam vessel differed more widely from the present cruiser or battleship than it did from the sailing ship of Nelson's time, in all respects, and not the least in sanitation. Rotting wood instead of steel; spaces below and in the bilges unseen and inaccessible for years, filled with muck, instead of dry, electric-lighted compartments. Now pure distilled water almost compulsory, artificial ventilation instead of practically none at all, passages measured by days instead of weeks, cold storage and ice in the tropics, a ration corresponding to modern ideas and possibilities, and above all a more humane discipline and comparative absence of drunkenness. Flogging had been abolished by act of Congress in 1850, (September 28), the grog-ration in 1862 (after September 1). All these improvements had been eagerly advocated and adopted with the advance of science by the Medical Corps of the Navy. Besides Barton we can only refer to works published by Horner, Ruschenberger, Joseph Wilson, and others, which show them to have been well acquainted with the latest discoveries of the day. One curious incident may be noted, taken from Dr. Horner's work "Diseases and Injuries of Seamen" etc., viz: That as late as 1828 it was found necessary to resort to inoculation on board the "Macedonian," homeward bound from Brazil, which vessel had been infected by smallpox just before sailing. A graphic and terrifying picture is given of this epidemic, and others occurred even later on different ships from lack of the commonest precaution on the part of their commanders.

In 1835 (act of March 3) the pay of Medical Officers as well as of others was somewhat increased, and regulated, as at present, according to the duty performed, whether at sea, on shore, or on leave. It may as well be said here, that after various changes since, the passage of the Personnel Bill (act of March 3, 1899) has assimilated the pay of all officers with

that of the Army, with the result of considerable uncertainty as to its exact amount under certain conditions.

In 1842 (act of August 31) the board of three commissioners was abolished and Bureaus were established, five in number, one of which was to be called the Bureau of Medicine and Surgery, with a Chief, to be appointed by the President with approval of the Senate, from the surgeons of the Navy. This system is still in force, the title of Chief of Bureau being changed to that of Surgeon General in 1871. Then also the grades of Medical Director and Medical Inspector were established with the futile allowance of six years in computing "relative" rank and precedence.

The complete list of these heads of the Corps, with terms of service is as follows:

CHIEFS OF THE BUREAU OF MEDICINE AND SURGERY,
1842-1902.

	FROM	TO
Surgeon WILLIAM P. C. BARTON,	1 Sept. 1842	31 Mar. 1844
Surgeon THOMAS HARRIS,	1 Apr. 1844	30 Sept. 1853
Surgeon WILLIAM WHELAN,	1 Oct. 1853	11 June 1865
Surgeon PHINEAS J. HORWITZ,	12 June 1865	30 June 1869
Surgeon-General WILLIAM M. WOOD,	1 July 1869	24 Oct. 1871
Surgeon-General JONATHAN M. FOLTZ,	25 Oct. 1871	9 June 1872
Surgeon-General JAMES C. PALMER,	10 June 1872	4 July 1873
Surgeon-General JOSEPH BEALE,	5 July 1873	30 Dec. 1876
Surgeon-General WILLIAM GRIER,	2 Feb. 1877	5 Oct. 1878
Surgeon-General J. WINTHROP TAYLOR,	21 Oct. 1878	19 Aug. 1879
Surgeon-General PHILIP S. WALES,	26 Jan. 1880	26 Jan. 1884
Surgeon-General FRANCIS M. GUNNELL,	27 Mar. 1884	26 Mar. 1888
Surgeon-General JOHN M. BROWNE,	2 Apr. 1888	9 May 1893
Surgeon-General JAMES R. TRYON,	7 Sept. 1893	7 Sept. 1897
Surgeon-General NEWTON L. BATES	1 Oct. 1897	18 Oct. 1897
Rear-Admiral WILLIAM K. VANREYPEN,	22 Oct. 1897	25 Jan. 1902
Rear-Admiral PRESLEY M. RIXEY,	10 Feb. 1902	.....

Even the briefest sketch of the history of the Medical Corps would be incomplete without some notice of the constant and increasing efforts of its leaders to effect improvements in details pertaining to the proper care of enlisted men in health as well as in sickness, in peace as well as in war. Sometimes these efforts were successful, but generally only

after long struggles and at times the most jealous and short sighted opposition from the very officers whose professional achievement or failure might depend ultimately on just such conditions. It is now so universally admitted that even under the most favorable circumstances during a war the losses and casualties from wounds received in action are infinitesimal as compared with those arising from often preventable disease, that it seems wonderful that any commander should not have welcomed any possible hygienic improvements. Yet such was very far from being the case, though, as we have seen, some of the famous captains like Decatur, Commodore Porter and Rodgers are gratefully acknowledged by Barton to have done what they could to aid the Surgeon in his often hopeless attempts. At present the value of sanitation is generally recognized by commanding officers of ships, and the vast changes of recent years, some of which have been alluded to, certainly make its practice much easier. Food, clothing, ventilation, light, water supply, dryness and warmth, and also what has been somewhat affectedly termed "moral hygiene" are now allowed to be within the medical officer's peculiar province, and in proportion to his practical knowledge of all these things, often only to be derived from experience and special study, will be his value to the service and the country.

THE RATION OF 1801.

Sunday—14 oz. bread $1\frac{1}{4}$ lb. beef, $\frac{1}{2}$ lb. flour, $\frac{1}{4}$ lb. suet, $\frac{1}{2}$ pt. distilled spirits.

Monday—14 oz. bread, 1 lb. pork, $\frac{1}{2}$ pt. peas, $\frac{1}{2}$ pt. distilled spirits.

Tuesday—14 oz. bread, 1 lb. beef, 2 oz. cheese, $\frac{1}{2}$ pt. distilled spirits.

Wednesday—14 oz. bread, 1 lb. pork, $\frac{1}{2}$ pt. rice, $\frac{1}{2}$ pt. distilled spirits.

Thursday—14 oz. bread, $1\frac{1}{2}$ lb. beef, $\frac{1}{2}$ lb. flour, $\frac{1}{4}$ lb. suet, $\frac{1}{2}$ pt. distilled spirits.

Friday—14 oz. bread, 4 oz. cheese, 2 oz. butter, $\frac{1}{2}$ pt. rice, $\frac{1}{2}$ pt. molasses, $\frac{1}{2}$ pt. distilled spirits.

Saturday—14 oz. bread. 1 lb. pork, $\frac{1}{2}$ pt. peas, $\frac{1}{2}$ pt. vinegar, $\frac{1}{2}$ pt. distilled spirits.

(In 1842, tea or coffee or cocoa was added, with dried fruits and pickles or cranberries, and allowance of spirits reduced to 1 gill.)

In the Act of Congress March 2, 1855 (five years after the abolition of the disgraceful penalty of flogging) regulating and defining legal punishments, it was prescribed that the officer ordering a court-martial must remit, in whole or in part, any punishment declared by the Senior Medical Officer present, in writing, to be liable to produce serious injury; or, without delay he must resubmit the case to the Court, or to another court having power to remit, on testimony already taken, the former punishment, and assign another (authorized one) in place thereof. This law was afterwards altered or construed to mean that a written certificate was required from the Medical Officer to the effect that the execution of the sentence (usually of imprisonment for a limited time, with reduced rations) would not produce permanent injury to the culprit.

The dress of the enlisted man was thus defined in 1818: "In winter, blue jacket and trousers, *red* vest, yellow buttons, black hat. In summer, white duck jacket, trousers and vest." It is to be hoped for the sake of humanity that a *straw* hat was understood in the latter section.

The "black hat" was that described by Joseph Wilson in 1860, as "made of the straw one by covering with linen and saturating with beeswax and black paint. It weighed about two pounds, and was polished to shine like varnish. This absurdity is probably quite obsolete, though a few specimens like mummies, may be preserved in the cabinets of the curious." ("Naval Hygiene," p. 53).

During the last forty years especially great exertions have been made by various Chiefs of Bureau to enlarge the field of this sort of knowledge by requiring reports from ships and stations annually ("sanitary and hygienic reports") of which there are many volumes containing much of value.

The advances of foreign navies are carefully noted, and encouragement was generally given to all medical officers to study and to publish. Delegates were sent to great national and international meetings of the profession. Scientific apparatus and instruments of precision were issued as far as funds would permit, especially microscopic outfits, more recently sterilizing and bacteriological apparatus, both for clinical uses and for investigation, and in fine it was endeavored to keep pace with the steady advance of medical science. A Museum of Hygiene was founded in Washington in 1882, an act of Congress (August 7) making an appropriation of \$7,500 for it: From being at first a mere laboratory of a single room, a considerable collection of objects pertaining to sanitation has been made, and since 1894 they have been transferred to the former Observatory Building. Here all microscopes are issued and returned, and it is well equipped with all necessary clinical and bacteriological apparatus for clinical analysis, etc.: a school of instruction was a part of the design, such as was instituted in connection with the Naval Laboratory at Brooklyn, N. Y., but like that, has been largely inoperative owing to the urgent need for the services at sea of young medical officers as soon as they were commissioned. It may also be mentioned that exhibits, models, etc., pertaining to the Corps have been sent to various expositions of late years.

The limit of age imposed on the entrance of Assistant Surgeons soon after the act of 1828, (from 21 to 26 years) might be and sometimes was waived by the Secretary of the Navy up to 1871, when it was fixed by act of Congress. It has already been mentioned that the maximum was raised to thirty (Act of May 4, 1898).

An important advance was the establishment of a naval hospital corps, (act of June 17, 1898), under the administration of Surgeon General Van Reypen, to whom also the Corps is indebted for the Hospital-ship "Solace," to be mentioned later.

Before this time an apothecary was appointed by the surgeon of a ship, for the cruise, with the approval of the

commanding officer; or he was later enlisted, and then rated. The result was generally unsatisfactory to the apothecary, or to the service, or both; the position was not tempting to a competent man of good character. The nurses or baymen were still more untrained and were often detailed from the more worthless landsmen on deck, as if the care of the sick was a matter of no importance. The act in question provided for 25 pharmacists, with the rank, pay and privileges of warrant officers, and for an indefinite number of hospital stewards and hospital apprentices (first and second class), according to the judgment of the Secretary of the Navy who was empowered to make regulations for their enlistment and government. Enlisted men of the Navy or Marine Corps were eligible for transfer to the Hospital Corps and vacancies in the grade of pharmacist were to be filled by the Secretary of the Navy from the hospital stewards by selection; all necessary hospital and ambulance service everywhere to be performed by members of this corps, and the corps was permanently attached to the Medical Department of the Navy. The pay in the enlisted rates varied from \$60 to \$20 per month on entrance, with the same increase on length of service as to other enlisted men, and all benefits to other warrant officers and enlisted men, now or hereafter to be allowed, were to apply to the Hospital Corps. It will be evident how much this tended to the organization of medical service, and it may be said that the result has been increasingly beneficial.

We quote from Surgeon General Van Reypen's report for 1898.

"It was known before the war [with Spain] that a corps of volunteer medical officers would be a necessity, and before war was declared, or any law passed authorizing their employment, medical boards of examination were established in Boston, New York, Philadelphia, Washington, Norfolk, and Mare Island, Cal., to examine applicants for appointment, such appointment being contingent upon their services being required. As the result of their examinations a waiting list of well educated medical men was ready, from which appointments

were made as soon as their services were required after the declaration of war. Over two thousand applications were received but only a small proportion were examined. Out of this number 42 were appointed assistant surgeons. They have rendered efficient service and have been a credit to the Navy. Some have had unusual and trying experiences but they have accommodated themselves to their environments and have justified their appointments.

"One of their number, Assistant Surgeon John Blair Gibbs, was killed in action at Guantanamo while serving with the Marine Battalion. He was the only medical officer killed during the war.

"In addition to the above appointments, 11 passed assistant and 8 assistant surgeons were mustered into the service with the Naval Reserves from the several States."

Many or most of the appointed acting assistant surgeons were afterwards taken into the regular service in accordance with the Surgeon General's recommendation, their age being waived, (act of June 7, 1900) thus increasing the Corps by 25. By the same act assistant surgeons were given Army rank, which obviated the disagreeable necessity of their going to sea in a steerage.

Another act of this Surgeon General, which has reflected great credit on the Corps is the establishment of the hospital or ambulance ship "Solace," formerly the "Creole" of the Cromwell line of steamers.

This vessel was selected, purchased, and fitted out by him by authority of the Secretary of the Navy and under direction of the President personally at his solicitation, in the remarkably short time of sixteen days, and the service she rendered in Cuba will be still remembered. She was indeed "the pioneer in her work, and indicates a step in advance that it well became the United States to take." (Report of 1898). She was fitted out under the requirements of the Geneva Convention and flew the Geneva Cross flag. She had a modern and ideal operating room with all aseptic and sterilizing apparatus for surgical work, a staff of four medical

officers, three hospital stewards (one a skilled embalmer), eight trained nurses, a cook, four messmen, and two laundrymen, specially appointed for this service. The energy, foresightedness, and executive ability of Surgeon General Van Reyepen were highly exemplified during the whole course of the war, and added to the reputation of the Corps.

No special mention has been made of the various wars and combats in which this country has been engaged during the past century, and in which the Medical Corps of the Navy took part; first, because the nature of their duties is such that *military* fame—the fame that comes from destroying life—is out of the question and quite apart from them except in a few isolated cases of petty warfare; and second, because the real and often not the least dangerous combats waged by the medical men, are waged in time of peace, and are perpetual. In active service, in the technical sense, his risks are not so much greater by comparison, while his services are more valued and his recommendations more likely to be considered. It is true that in the very important branch of operative surgery, only the constant practice that comes from a prolonged and bloody war can give him the chance of reaching the eminence of the great leaders of the profession in civil life, and perhaps the days are past when a Larrey took precedence of all operators. Yet it is with an honorable pride that we can claim that for many years at least, our actual bodily risks in war itself are about the same as those of other officers. In the Army, the long-range projectiles have made the “zone of fire” a wide one, and wounded men on the field would fare but ill if their ambulances waited for perfect safety to relieve them. The records may speak as to that. On board ship the old disparity of “on deck” and “below” has long passed away. One spot is about as safe as another, all things considered, in action, while in accidental casualties, wrecks, collisions, etc., all on board pay an equal tribute. In the great Civil War five medical officers were reported lost in vessels sunk by the enemy, or killed in action, and nineteen of the line. Among the few commissioned officers of the Navy who lost their lives

during the war with Spain, was, as already noticed, Assistant Surgeon John Blair Gibbs, on shore at Guantanamo. Passed Assistant Surgeon Lung at Samoa did more than his duty, and undoubtedly helped materially to bring in the party of men with him after the lamented death of their commanding officer. Assistant Surgeon Lippitt received a wound at the siege of the Legations in Pekin. Many more such instances might be given, but it is not desired to extol unduly the merits of the living, nor would it be agreeable to them. Personal bravery, even in trying and unfamiliar emergencies is only what is expected and often demanded from all officers in military service. But two examples of unusual heroism, where devotion to duty has been sealed and consecrated by inevitable and anticipated death, may well be cited for the honor of the corps to which the heroes belonged. The barest and briefest records are the best. In a description of the engagement at Fort Fisher, January 15, 1865, Lieutenant-Commander (now Rear Admiral) T. O. Selfridge says: "While kept under the walls of the fort, I was an eye-witness to an act of heroism on the part of Assistant Surgeon William Longshaw, a young officer of the medical staff, whose memory should ever be kept green by his corps, and which deserves more than this passing notice. A sailor too severely wounded to help himself had fallen close to the water's edge, and with the rising tide would have been drowned. Dr. Longshaw at the peril of his life went to his assistance and dragged him beyond the incoming tide. At this moment I heard a cry from a wounded marine, one of a small group, who, behind a little hillock of sand close to the parapet, kept up a fire upon the enemy. Longshaw ran to his assistance, and while attending to his wounds was shot dead. What made the action of this young officer more heroic, was the fact that on that very day he had received a leave of absence, but had postponed his departure to volunteer for the assault." ("Battles and Leaders of the Civil War." Century Co., Vol. IV, p. 661).

Dr. Longshaw had previously distinguished himself by carrying under fire a line in a boat to a monitor aground on a bank, at the attack on Fort Sumter.

It is difficult to surpass the heroism of such a sacrifice as this of Dr. Longshaw's where he gave his life to his strictly professional duty, not to mere recklessness and ostentatious valor. Yet an even more affecting one is that of Passed Assistant Surgeon James M. Ambler (born in Virginia, December 30, 1848), Surgeon of the ill-fated "Jeannette," Arctic Expedition, who died, probably the very last of his separate party in the Lena Delta, October 1881. There again let the record speak, taken from the tablet erected to his memory by his brethern of the Corps, and now in the Naval Museum of Hygiene, Washington. The simple, unconsciously pathetic and noble words quoted from his diary, which could only by the merest chance ever be found, written in such miseries of suffering and starvation as war can hardly parallel, are his best memorial:

THE MEDICAL OFFICERS OF THE NAVY

IN MEMORY OF DR. AMBLER'S NOBLE EXAMPLE
AND HEROIC DEATH

HAVE PREPARED THIS TABLET.

* * * * *

James Markham Ambler, Passed Assistant Surgeon, U. S. Navy, was born in Virginia December 30th, 1848; entered the naval service as an Assistant Surgeon April 1st, 1874; volunteered as the Medical Officer of the U. S. Jeannette Arctic Expedition and died with his companions on the banks of the Lena River in their memorable retreat from the Arctic Ocean and the desperate struggle with cold, storms and starvation.

Dr. Ambler was one of the strong men of that expedition; cheerful and heroic in the face of every danger, he willingly and apparently without effort sacrificed his life to remain with his Commanding Officer and sick and dying companions.

The following extract from Dr. Ambler's Journal tells the story which has been partially reproduced in bronze:

"Sunday, 9th October, 1881.

"Yesterday without food except the alcohol: the Captain spoke of giving the men option today of making their way as best they could * * *. I told him if he gave up I took command, and no one should leave him as long as I was alive. I then suggested that we send two men ahead to try and make the settlement, and that we make the best of our way with the rest of our party. This was done: Ninderman and Noros are ahead. God give them aid: and we are getting along.

"The Captain gave me the option of going ahead myself but I thought my duty required me with him and the main body for the present."

It is only necessary to mention the name of Elisha Kent Kane, who entered the Medical Corps of the Navy July 21, 1843, and died February 16, 1857, at Havana, his health broken by the hardships of his voyages of exploration.

W. P. C. Barton (born in Philadelphia in 1783,) of a family distinguished in American medicine through several of its members, and whose volume already mentioned is perhaps the most reliable source of information for the earlier history of the Corps, also published two works on the Botany of Philadelphia and of the United States.

W. S. W. Ruschenberger, who passed a long life in the service, was the author of several books on natural science, as well as of at least one description of a cruise abroad.

G. R. B. Horner, author of "Diseases and Injuries of Seamen," "The Medical Topography of Brazil and Uruguay" etc., may yet be consulted with profit by those desirous of getting a glimpse of the "old Navy."

Joseph Wilson (Medical Director, entered service in 1843, died 1887) published the first American titular work on Naval Hygiene, though his predecessors had included very many observations on that science in their volumes.

The late Medical Director A. L. Gihon, only recently deceased, has also written a handbook on this subject, and was recognized as an authority both in this country and elsewhere.

Of those still living, but retired from active service, the Corps may be proud to claim Medical Director Edward Shippén, whose various literary and historical writings, both in book form and in periodicals, are well known beyond the limits of the Navy; and Medical Director James M. Flint, whose researches in natural science have given him a reputation, especially as an authority on the Foraminifera.

The most important subject pertaining to the history of the Medical Corps of the Navy, not merely as regards its status and dignity in the Service, but still more its efficiency in the discharge of its duties for the common benefit, is that of the *rank* and the standing of its members. It was at first my intention to give an abstract, however brief, of the continuous

efforts of the Corps to secure such a position as had long before been given the medical officers of foreign navies, and which was granted our brethren of the Army as early as 1848. These efforts begun certainly by 1812 (and here again reference must be made to W. P. C. Barton's work, already so much quoted) met with the approval and very generously expressed sympathy of many of the old Captains famous in the war with Great Britain, and, generations later, of the illustrious Farragut. It is not necessary to argue the justice of these claims before the readers of this paper. But even the barest statement of the contest between the Medical Corps (in common with the other Staff Corps of the Navy) and the main body of the Line Officers, which reached its maximum of intensity a few years after the Civil War, is impossible without reviving feelings better forgotten or ignored.

"incedis per ignes
Suppositos cineri doloso."

—(*Horace, B. II, Ode I.*)

It is hoped that not only recent legislation, especially that already alluded to, doing away with the absurd term "relative" in defining "rank," but also a better understanding between the different branches of officers of the Navy, may have laid the foundations of a real harmony and a consequent administration of duties without encroachment or undue pretension on either side.

Reference may be made, for the benefit of those who are interested in this matter, to the work, "The Principles of Naval Staff Rank," published in 1869, by "A Surgeon in the U.S. Navy" (believed to be the late Medical Director George Clymer: died 1881) and to all the "manifestoes," "remonstrances" and other published communications of Line officers, which were generally republished and circulated by the Staff, with or without comments, as their own strongest argument, and herewith I dismiss the subject.

THE MEDICAL CORPS OF THE NAVY FROM THE
OUTBREAK OF THE WAR WITH SPAIN
TO THE PRESENT TIME.

By CAPTAIN ROBERT AUGUSTINE MARMION,
MEDICAL DIRECTOR, UNITED STATES NAVY.

THERE is probably no Executive Department of our Government concerning whose organization and workings less is known by the public at large than the Navy. If this be true of that branch as a whole how strongly must the remark apply to the many bureaus which enter into its composition. A distinguished member of Congress who was already serving his constituents for a fourth term, once asked me, "Who are the staff corps of the Navy?" He had just emerged from the House of Representatives where he had been an unwilling listener to an acrimonious debate on matters appertaining to the line and staff of the Navy. The bitterness of this debate and the strange things which he heard, so aroused his curiosity that he went in search of information from some other member who, he was sure could explain matters to him, for three years service as a Colonel during the Civil War did not avail him anything.

As the net result of his inquiry in the House he learned that "staff officers in the Navy are those who are on duty in Washington." It is probable that most naval officers have, many times, witnessed displays of ignorance no less glaring than this, even in quarters where one would not expect to find it. This complaint can not be made concerning the Army for frequent contact with it has schooled our people sufficiently for all practical purposes; whereas there are many millions of our citizens who have never seen a man-of-war and have had, perhaps, no provocation for studying any of the details of our naval organization. I do not purpose in

this paper to enter upon so rash a work as an explanation of the organization of the Navy as it exists now. While all branches of the service have, for years, suffered in various ways and to a varying degree, from the fact that so little has been and is known concerning us and our wants, it is only with the medical corps of the Navy that I shall deal, viewing it as it has been since the outbreak of the Spanish War, especially in matters of organization and duty. At the beginning of the period referred to the Medical Corps consisted of fifteen Medical Directors with the relative rank of Captain, fifteen Medical Inspectors with the relative rank of Commander, fifty Surgeons with the relative rank of Lieutenant, or of Lieutenant-Commander, and ninety "Assistant Surgeons" with the relative rank of Ensign or of Lieutenant (Junior Grade). The Act of Congress approved March 3, 1871, by which the general features of this organization were created, provided that Assistant Surgeons who shall have served three years two of which must have been on board of a naval ship in commission, shall be entitled to examination for promotion to the grade of Passed Assistant Surgeon wherein they should have the relative rank of Lieutenant [Junior Grade] or of Lieutenant, and with pay increased beyond that which they received as Assistants, with an increase for their second five years as such. The same law authorized an increase of pay for second five years of service as Assistant Surgeon; but few, if any, ever remain that long in that grade since the law provided for promotion, under certain conditions, at the end of three years service, and as the number of Passed Assistant Surgeons was not limited, it was, and still is, possible for all in the lowest commissioned grade of the Medical Corps to be Passed Assistants. This never happened, as a matter of fact, but such a condition would not have been in conflict with either the letter or the spirit of the law. I have stated that the organization of the Medical Corps of the Navy which existed at the outbreak of the war with Spain was, practically, that which was created by the Act just named. The only change in the organization which

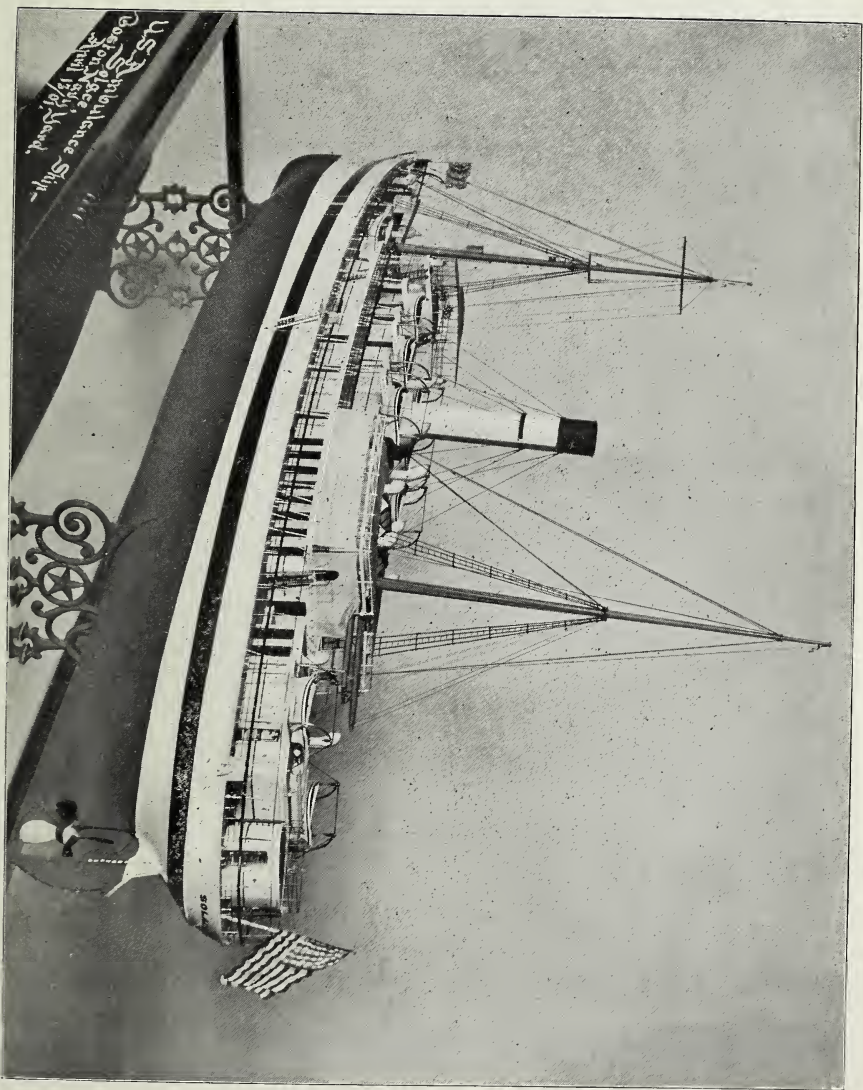
had taken place since the passage of that Act was a reduction of ten in the number of Assistant Surgeons caused by an Act approved August 5, 1882. As the Corps had had more than ten vacancies in it for a long time, this reduction was never felt. When it seemed to all students of our foreign relations that war with Spain was a matter of the near future, Surgeon General Van Reypen of the Navy asked that Congress grant the power to appoint twenty-five Acting Assistant Surgeons for temporary service. The new Navy had gone on increasing at a rapid pace, many new ships were actually in commission, many more had been appropriated for, and the enlisted force was growing by fresh levies provided for by each Congress, and yet, in spite of the fact that the burthen of the work for the Medical Corps necessarily kept pace with the increase of the enlisted force, no provision had been made for increasing, in any manner, the working force of the Medical Corps. The logic of the situation appealed strongly to Congress, and the request for the temporary relief was granted in an Act which was approved May 4th, 1898. Thus with the one hundred and ninety-five medical officers on the active list allowed by already existing law and the twenty-five temporary appointments recently authorized, the war with Spain found us equipped with a possible corps of medical officers on the active list of sufficient size, as the sequel proved, to satisfactorily perform all of the medical and surgical work incidental to that conflict. An old clause of the Revised Statutes, approved March 3d, 1873, gives the President power to place any retired officer on duty in time of war, and thus it was possible for the navy to utilize a number of the retired medical officers for such shore duty as recruiting, etc., thus increasing the number of able-bodied medical officers available for sea duty.

The most important change in the status of the Medical Corps of the Navy is that which was effected by an Act approved March 3rd, 1899, and usually known and spoken of as the "Personnel Bill," since its provisions related entirely to matters of organization of the personnel. While no increase

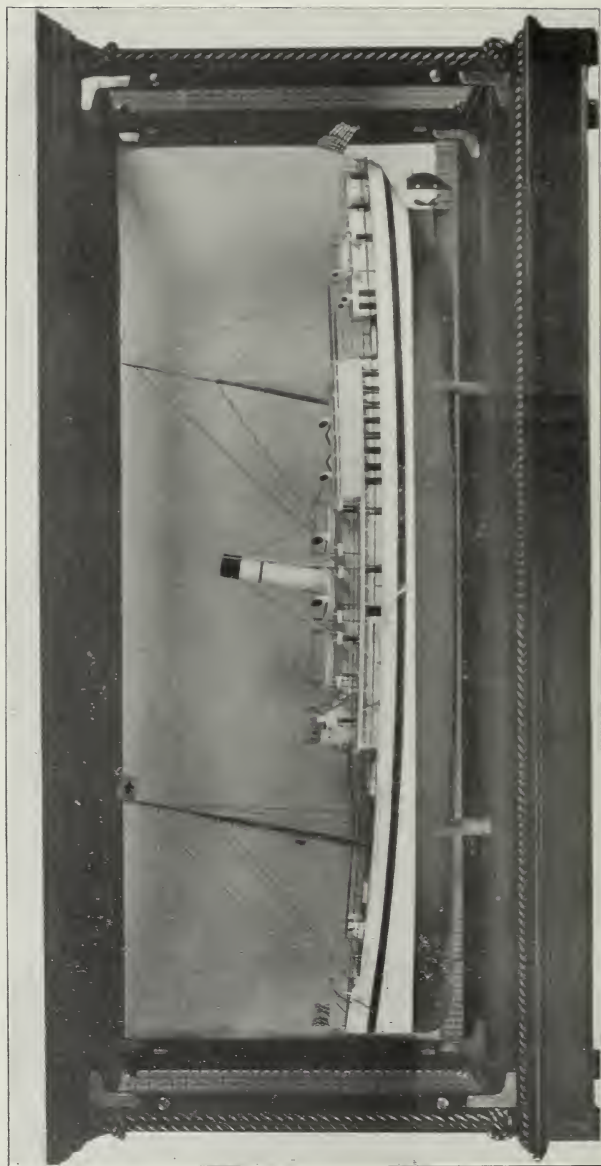
of members nor changes of titles were wrought by that measure in the commissioned personnel of the medical corps, general legislation was embraced in it which had been sought for during a period of nearly forty years. In the preceding remarks on organization the words "relative rank of" have been frequently used in explaining the legal status of the various grades from a military standpoint. The word "relative" had been found, by actual test, to be a thorn in the side of the medical corps in common with all of the staff corps. It was intended, and believed by Congress, when the act of March 3rd, 1871, was passed, that all questions of rank and precedence between officers of the line and of the Staff of the Navy would be settled, for all time by that measure, and the word "relative" as qualifying rank in the staff corps would, it was claimed, not be prejudicial in any way and thus the hostile feeling existing between Line and Staff would be forever appeased.

That dream was not realized, however, for when the question was asked as to what "relative rank" meant it was found that there were many conflicting opinions. The late Honorable George M. Robeson, who had then been Secretary of the Navy for two years, when asked by one of the senior medical officers of the Navy what his explanation of "relative rank" was, replied that after a most careful study of the matter he had been unable to understand it. A question so complex and leaving so much room for individual interpretation, naturally led to many disagreeable consequences, both in its effect upon the discipline of the service, and in the social relations of its officers.

Probably nothing has done more to turn away young medical men from our corps, than the evils growing out of that unfortunate status, in which the term "relative rank" placed us. Where there is so much bitterness as existed at times there was sure to be much misunderstanding and much misrepresentation. In some instances a crusade was preached, in medical colleges, against the laws governing the naval medical corps and undergraduates were warned not to enter it. By



Model of the United States Ambulance Ship, "Solace."



Model of the United States Ambulance Ship, "Solace."

the terms of the personnel bill medical officers of the Navy were given rank as definite and positive as that which is borne by officers of the line. That bill also established a payable by whose provisions the Line, Medical and Pay Corps receive an increase of pay every five years, and are, also, allowed a definite sum ("commutation") for quarters according to their rank in cases where quarters "in kind" are not furnished by the government. Prior to the passage of this Act there had not been any such provision.

The most distinct, and, at the same time, the most interesting advance, in a professional way, since the equipment of our hospitals with aseptic operating rooms, is represented in the ambulance ship "Solace" which was first put in use during our war with Spain. To Medical Director Van Reypen, then Surgeon General of the Navy, is due the credit of this most valuable adjunct to the fighting fleet. Under his administration and controlled by his views, the vessel was equipped and in service throughout the recent war. When one considers all of the conditions that had to be dealt with, in making a sea going vessel meet all of the essential requirements of a modern hospital, where surgical cases form such a large part of its patients and where, therefore, asepsis is so difficult to secure, the statistics of the "Solace" are most flattering. I feel that I can not give a better idea of the arrangements and resources of this vessel, than by quoting the description given of her by Passed Assistant Surgeon Stokes of the Navy, who was attached to her. Dr. Stokes says:

"She is primarily a vessel adapted for the care and welfare of sick and wounded men, and all other considerations are made subservient to this end. She has a displacement of 3600 tons, and an average speed of 14 knots; is 352 feet on the load-line and about 370 feet over all. Forward, below is a tank of 27,000 gallons capacity. The ship carries powerful steam launches and barges for transferring the sick and wounded at sea. On the upper deck on both sides there are steam winches for hoisting and lowering the wounded, or

boats, which can be used simultaneously. On the uppermost deck are some of the officers' quarters, and offices; on the next deck, forward, is an operating room 30x30 feet, well lighted and magnificently equipped with aseptic hospital furniture of the best pattern, and the outfit of instruments, sterilizers, dressings, etc., is complete in every detail. The floor is so tiled that it can be easily cleaned and slipping avoided. A dressing room and a dispensary adjoin the operating room. On this deck are mess rooms for the officers of the ship, for wounded officers able to be about, and for the petty officers of the ship. There is a lounging and smoking room for those able to be on deck.

"On the engine-room deck is a fully equipped steam laundry, with a drying room, and a disinfecting chamber for wash clothes. An ice-machine has been set, and a cold-storage room of good size is ready for use. The ship is equipped with three large formaldehyd generators.

"There are numerous staterooms for wounded officers, and the men will be berthed in spacious wards in the forward and after parts of the ship, below, which will be ventilated by powerful blowers and supplementary electric fans. The vessel is heated by steam and lighted by electricity throughout. There will be accommodations for about 350 patients.

"There are four medical officers attached to the ship: three apothecaries, one of whom is a trained nurse and an embalmer; eight graduated nurses from the Mills Training school, Bellevue Hospital; two laundrymen and a cook. Four mess attendants for the sick and wounded complete the medical department of the ship.

"As soon as an action is over the steam-launches of the 'Solace' will tow their barges alongside the ships that have been in action, and the wounded will be lowered into them, and the boats will return to the ambulance-ship, when the wounded will be brought on board and placed in the surgeon's care for treatment. With the facilities at hand the results ought to be excellent.

"In no sense is the 'Solace' a hospital ship. When it is found that a second action is not impending she will steam to

the nearest hospital and place her sick and wounded on shore for treatment, and will then rejoin the fleet. Should the army invade Cuba, it will probably fall to her lot to transfer its wounded to Key West. The vessel is more properly designated an 'ambulance ship.'

"This ship will fly the Red Cross and will be protected by the articles of the Geneva Convention."

Of the twenty-five Acting Assistant Surgeons for temporary duty, authorized by Congress in May, 1898, who were employed during the Spanish War, some resigned and others entered the permanent service; so that, by June 7th, 1899, this number had been reduced considerably. Congressional action, approved on this date, authorized the transfer to the regular navy of the remaining fifteen thus extinguishing the "volunteer navy" so far as its medical corps is concerned. At the same time, the grade of Surgeons on the active list was increased from fifty to fifty-five and the number of Passed and other Assistant Surgeons was increased to one hundred and ten. Another clause of that Act provides that "Assistant Surgeons in the Navy shall rank with Assistant Surgeons in the Army, thus raising, by one grade, the rank of entrants, namely, from that of "Ensign" (assimilated to Second Lieutenant in the army) to that of "Lieutenant Junior grade" (equivalent to First Lieutenant). By further legislation all officers appointed to the Navy from civil life are credited with five years seniority. The effect of this upon the pay of entrants will be referred to by and by.

To summarize, then, the Medical Corps of the Navy as at this moment authorized by Congress consists of:

TITLE.	NUMBER.	NAVAL RANK.	EQUIVALENT ARMY RANK.
Medical Director,	15	Captain,	Colonel,
Medical Inspector,	15	Commander,	Lieut. Colonel,
Surgeon,	55	Lieutenant, or Lieut. Commander,	Captain or Major,
Passed Assist. Surgeon,	} 110	Lieut. Jun. Grade or Lieutenant,	First Lieutenant or Captain,
Assistant Surgeon,		Lt. Jun. Grade,	First Lieutenant.

Following is a table showing the pay and allowances per annum of Medical officers :

PAY TABLE.

	AT SEA.	ON SHORE.	ALLOWANCE PER ANNUM.
Assistant Surgeons :			
Rank of Lieutenant (junior grade).	\$1,650.00	\$1,402.50	\$288.00
Passed Assistant Surgeons:			
Rank of Lieutenant (junior grade).	1,650.00	1,402.50	288.00
After five years in the service...	1,800.00	1,530.00	288.00
Rank of Lieutenant	1,980.00	1,683.00	432.00
After five years in the service...	2,160.00	1,836.00	432.00
After ten years in the service...	2,340.00	1,989.00	432.00
Surgeons :			
Rank of Lieutenant—			
After ten years in the service...	2,340.00	1,989.00	432.00
After 15 years in the service....	2,520.00	2,142.00	432.00
Rank of Lieutenant-Commander—			
After ten years in the service....	3,250.00	2,762.50	576.00
After 15 years in the service....	3,500.00	2,975.00	576.00
Medical Inspectors:			
Rank of Commander—			
After 15 years in the service....	4,000.00	3,400.00	576.00
Medical Directors:			
Rank of Captain—			
After 15 years in the service....	4,500.00	3,825.00	720.00
Surgeon-General:			
Rank of Rear-Admiral.	5,500.00	5,500.00	720.00

Officers serving on shore in Puerto Rico, Cuba, the Philippine Islands, Hawaii and Alaska receive the same pay as allowed in this table for "sea duty."

Perhaps, all things considered, it is not surprising that so many false ideas are prevalent regarding many of the details of life in the medical corps of the Navy, and foremost among these is the impression that political influence is an essential pre-requisite in securing an appointment to it. Our people are so much in the habit of thinking that no appointment under the National Government can be secured except through Civil Service channels, or through the backing of strong political friends. As a matter of fact the former has no bearing and the latter is not important. There is no per-

manent appointment in the regular naval medical department with which the Civil Service Commission has anything to do, and all that any influential friend can do—and he need not be a politician—is to supply an intending candidate for the corps with a letter certifying to his character as a reputable person. The law requires that all candidates for appointment in the Medical Corps of the Navy shall be citizens of the United States, over twenty-one and not over thirty years of age, and that they must be examined by a Board of medical officers of the Navy to determine their physical, mental, and professional fitness for such appointment. Boards of this kind are always in session, namely one at New York Naval Hospital and one at Mare Island, California, Naval Hospital. Permission to be examined by one of these Boards, is easily obtained by asking the Secretary of the Navy for it, and circulars containing information as to the examination, may be secured by asking the Surgeon General: so that practically, from first to last, the candidate has his case in his own hands. The Board before whom he appears is sworn, in his presence, to examine him without prejudice or partiality, and he needs no outside aid to insure him justice. It is not necessary for me to go deeply into the details of this step since the subject has been exhaustively treated by Surgeon General Van Reypen in the April 27th, 1901 issue of the *Medical News* (of New York). The examination is thorough but it cannot be called unjust. Of course some fail to pass it: to lower the standard, however, would be a step backwards and would be disastrous to the lives of the many who are often at the mercy of the Medical Officer. Our professional brethren on shore may at short notice summon a colleague to advise and assist, and, it may be to share the responsibility of a desperate situation: the naval doctor often finds himself many hundreds of miles and very many days distant from a professional brother to whom he might turn for aid of any kind. He must rely solely upon his own professional resources, and the examination which he is called upon to submit to, is so modeled as to determine whether or not he is rich enough in those resources to be worthy of

appointment. If found qualified within the meaning of the law, the candidate is commissioned as an Assistant Surgeon, with the rank of Lieutenant—Junior Grade—in other words with the same rank as borne by officers of corresponding title on entering the Army. From 1871 to 1899 an Assistant was invested on entering with the relative rank of Ensign which is one grade lower than that with which he now enters. This latter rank made him a member of the "Junior Officers" ("Steerage") Mess, where, perhaps, all of his mess-mates were junior to him in age and rank, and where no end of discomfort awaited him. A knowledge of this fact has, probably, done more to deter young men from entering our corps than any other single cause. Happily this objection no longer prevails and all Assistant Surgeons are now members of the Ward-room mess which is composed of all the highest commissioned officers below the rank of the commanding officer of the vessel. Under normal conditions the first assignment of the newly-appointed is to the Naval Laboratory and Department of Instruction, at the New York station. Here he is taken through a special course, occupying several months and whose general scope is to go more deeply into certain subjects embraced in the college curriculum and, also, to receive instruction in special subjects, relating to the duties of a medical officer in the navy, and with which he could not be expected to be familiar before entering the service.

His next assignment is likely to be to a hospital, or, possibly, to a receiving ship, whence he is sent to a cruising ship or foreign shore-station. In this connection it may be of interest to exhibit a list of shore stations to which medical officers of the Navy are assigned for duty: Portsmouth, N. H.; Boston, Mass.; Newport, R. I.; New York City; Philadelphia; Annapolis, Md.; Washington, D. C.; Norfolk, Va.; Port Royal, S. C.; Pensacola, Fla.; Havana, Cuba; San Juan, Puerto Rico; San Francisco and Mare Island, California; Puget Sound, Washington; Honolulu, Hawaii; Yokohoma, Japan; Manila and Port Isabela and several isolated posts in the Philippine Islands, and Guam. Add to these shore sta-

tions seventy-seven vessels cruising in various parts of the world, and it will be seen that the naval doctor has the whole world before him as a field for his work. The acquisition of new territory, therefore, has more than a sentimental importance to him. To the pleasure derived from visiting strange countries and coming in contact with things which, hitherto, have had but a traditional existence for him, there are added the possibilities of a more or less prolonged residence among new types of mankind whose language, literature and mode of living are inexhaustible wells of interest to him. As a student of his profession he finds an abundance of material for study in the diseases which are peculiar to those climates and some of which can not be found elsewhere, while, in many instances, he is enabled to add largely to his stock of information on collateral subjects to a degree that could not be attained in any other way.

There are many instances in which members of the medical corps of the navy have enriched science and literature by work which has been suggested by travel and which would not, otherwise, have been undertaken by them. There are numerous instances of this in our national scientific archives and museums, for example. It has always been the policy of the Bureau of Medicine and Surgery to encourage study and original research, and if there has been, at times, an apparent indifference, it has been due to a lack of funds. Congress has not always been as generous in its appropriations as it is at present and there is good reason for believing that it will not be long before the scope of instruction which has existed in our "Department of Instruction" will be broadened far beyond its former limits. Habits of study are to be fostered and facilitated in all grades. There is no one to whom foreign doors are more quickly thrown open than to our national officers, and this is not confined to strictly official life, by any means. Thus many opportunities are promptly at our command which our lay brethren may only secure with difficulty, and often, not at all. In this way, too, one finds himself richly repaid for the time spent in the study of a language which will facilitate his intercourse with the new peoples among whom so much of his life may be spent.

The duties of the medical officer are, in the main, professional, but upon him devolves a responsibility which is second in importance to none other. It is his province, first of all, to prevent disease by his vigilance and timely warning, and, secondly, to bring to its management all of his ability and zeal. A moment's reflection will show that where he has no colleague on board of the ship there is no one to whose shoulders he may transfer his responsibility. This is true of no other officer in a man-of-war. While, therefore, succession to posts of responsibility on board ship is secured by the presence of persons qualified therefor (except in the case of the Medical Department, which often has but one commissioned representative in the ship's complement), it cannot be said that the position of the latter is thereby rendered less attractive.

The medical officer cannot look forward, with confidence, to opportunities which will load him with military honors, but he has the satisfaction of knowing that there are paths to glory which are not made by the sword. The roll of honor of our Corps contains the name of many a hero, who gave the most that any one can give to his country's cause—his life—and that list is constantly growing in peace as well as in war. Instances are not, by any means, wanting in any of our wars, where Naval Surgeons have received their baptism of fire in the performance of purely military duties, which have been recorded in history as deeds of special heroism. One's duty to his country is not circumscribed by strictly professional lines; and when the surgeon's presence is not needed at the operating-table, often we find him serving gallantly in other quarters.

Medical Inspector Rixey was appointed Surgeon General in January last, and is rapidly acquainting himself with the wants of our department. Already he has asked Congress for an increase of fifteen in the list of Surgeons and twenty-five in the list of Passed Assistant and Assistant Surgeons. With the many advantages and attractions which the Naval Medical Service now presents, it should not be long before all vacancies in the Medical Corps are filled by desirable men, when once, the great changes recently made in its organization are understood by the profession at large.

THE TRANSMISSION AND PREVENTION OF YELLOW YEVR.*

BY LIEUTENANT COLONEL VALERY HAVARD,
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ONE of the most brilliant medical discoveries of the age, fully as important to Tropical America as that of the immortal Jenner, was made in Havana during the last two years, and it will be the boast of this city that here was solved the momentous problem of the transmission and propagation of yellow fever, a solution of such practical significance that it indicated at once the measures which have completely succeeded in stamping the dreadful scourge out of Cuba.

With this discovery, two names are chiefly associated, that of Carlos Finlay who many years ago first enunciated the doctrine, and that of Walter Reed, president of the commission which established it. Plain justice also requires that our tribute of praise should be given to the Governor General, General Leonard Wood, whose keen interest in all scientific progress and wise liberality made this discovery possible.

So much has already been written and spoken about this subject that it seems like a work of supererogation, if not an imposition upon this Congress to take it up again. For my justification I wish to say that it was the desire of our distinguished president that I should prepare this paper, thinking that, at least for the benefit of the foreign members who have not had the opportunity of following the experiments of Reed and colleagues, a brief and clear presentation of the results obtained would certainly be desirable. Furthermore, it is necessary that this Congress, which so worthily represents

*Read before the Pan American Sanitary Congress in Havana, Feb. 29, 1902.

the medical profession of America, should, after mature deliberation, reach practical conclusions concerning the new doctrines of the transmission and prevention of yellow fever and it is my sincere hope that it will give them the stamp of its official recognition and approval.

Yellow fever is an infectious disease inoculated, like malarial fever, by the sting of mosquitoes; it is therefore not contagious in any sense of the term and no more communicable than malarial fever. That it is conveyed by mosquitoes, as intermediate host, has been proved beyond a reasonable doubt by the experiments of Reed, Carroll, Agramonte, Guiteras and others, with the accuracy and certainty of a mathematical demonstration, and no medical man who accepts these experiments has any more ground to reject the conclusions, inevitably reached by the logical mind, than he has to deny the efficacy of vaccination or of diphtheria antitoxine. In 24 experimental cases, publicly conducted at Quemados and Las Animas Hospital, yellow fever followed the bite of infected mosquitoes in non-immune men and women within the usual incubation period, and in each case the diagnosis was verified by the official commission of experts consisting of three Cubans and one American. Of these 24 cases, 3 died, and the pathological changes in all three, as revealed by post mortem examination, were, like the clinical symptoms, characteristic of the disease. It is hardly necessary to add that every precaution had been taken to avoid all possible chances of infection previous to the application of mosquitoes.

How many species of mosquitoes can transmit the germ of yellow fever? Only one is known to have this power, namely, *Stegomyia fasciata* (*Culex* mosquito, *Culex fasciatus*) first identified and experimented with by Finlay. Since this germ exists in the blood of patients, it follows that all mosquitoes which suck this blood ingest it and to that extent become infected. Whether this infection has any effect, injurious or beneficial, upon their life or power of reproduction is not known; such effect, if any, must be very slight; it is certain that they are nearly all incapable of communicating the in-

fection to man; in the *Culex* species, for instance, we must suppose that the germ is either destroyed, fails to find its way to the salivary glands, or else does not undergo the necessary transformation which renders it pathogenic to another host.

That *Stegomyia fasciata* is the only transmitting species is probable but has not been proven; it is possible that other species of *Stegomyia* may also possess that dangerous peculiarity. Thus, although *Anopheles maculipennis* is by far the most important species concerned in the transmission of malaria in Italy, the United States and Cuba, yet there are four other species of the same genus which have been found to harbor the parasite of Laveran. Filariasis is only known to be conveyed by one species, *Culex ciliatus* (*C. pipiens*). To the practical sanitarian, however, the question is not so much to know absolutely all the species capable of transmitting an infection, but rather what are the dangerous species commonly present in any one locality so that means may be devised for their destruction.

Stegomyia fasciata is found in the Southern United States, the West Indies, Central America, and eastern South America, that is to say, wherever yellow fever is endemic or epidemic. The 2 or 3 other species of this genus in America are quite rare and may be discarded as a practical factor in the causation of yellow fever. Although quite widespread, *S. fasciata* is nowhere so abundant as several species of *Culex*, being often completely absent where other kinds abound. Thus it was a most remarkable fact that during the epidemic of yellow fever of 1900, in Havana, none of the many non-immune nurses and employes of the yellow fever hospital (Las Animas) contracted the disease, although at that time mosquitoes were common and no particular care was taken to protect patients from their bites. This immunity was explained when, after a thorough fumigation, all the dead mosquitoes were examined by Dr. Guiteras and an exceedingly small proportion of them found to be *Stegomyia*.

The opinion has also been advocated that other suctorial insects, such as the bedbug and the flea, are capable of trans-

mitting yellow fever. Here it is necessary to bear in mind that this disease is not the result of blood inoculation from patient to non-immune by the mosquito's proboscis, but of the transmission of a specific germ in a pathogenic state. It has been seen that *Culex* mosquitoes, although absorbing blood with much vigor, are incapable of communicating yellow fever, and there is no serious proof that the bedbug and flea are capable of doing so. On the contrary, there are obvious facts which lead us to believe that they have absolutely nothing to do with it; thus, these insects are found all over the civilized world and at all seasons; whence comes it that yellow fever is strictly confined to certain tropical and sub-tropical zones, and only prevails in summer and fall? It may be answered that the germ is delicate, very sensitive to cold, and only thrives in warm countries. Why then is the disease absent from the Mediterranean Basin, North Africa and tropical Asia where the climate is certainly warm enough and the bedbugs and fleas are proverbially active? We also know that yellow fever is not only found in the hovels of the poor, where vermin may be abundant, but also and often in the mansions of the rich where cleanliness is the rule. In such mansions, yellow fever patients may complain of having been bitten by mosquitoes but never give any history of having been disturbed by bedbugs or fleas.

When is the yellow fever patient infectious, that is capable of infecting mosquitoes? Only during the first stage of the disease, namely the first three days. It is doubtful whether the germ can be conveyed to the mosquito during the first part of the first day, and it is probable that it can occasionally be conveyed on the 4th day; the exact limits have not yet been defined but it can be considered practically established that mosquitoes can bite patients after the 4th day with entire impunity. Therefore if the patient is protected with a fine-mesh screen during the first, or infective, stage, he ceases thereafter to be a source of danger to anyone.

When does the mosquito become pathogenic? This is one of the most interesting points of the whole subject. The

Stegomyia mosquito which has fed on a patient during the first three days of the disease becomes infected but cannot communicate it for a certain number of days afterwards; that is to say, as already mentioned, the disease is not the result of an inoculation of blood from man to man through the insect but of a more complicated process. Reed and his colleagues showed that the mosquito cannot infect man until at least twelve days have elapsed from the time it sucked infected blood. It had been observed, long ago, that secondary cases never appeared in less than sixteen to twenty days after the date of inception of the original case, a period of time which we now know to be made up of the following components: 1 or 2 days of the first stage of the original patient, 12 days before the mosquito becomes pathogenic, 3 or 4 days of incubation in the secondary patient after being bitten, a minimum total of 17 or 18 days.

Naturalists have discovered that the mosquito possesses salivary and poison glands, with a special duct opening into the proboscis, and that just before and while sucking blood, ejects an irritating secretion into the puncture, probably for the purpose of rendering the blood more liquid and absorbable. These salivary glands and duct then must be the channel through which the mosquito conveys the pathogenic germ while biting its victim. Are we to assume that when the *Stegomyia* mosquito has sucked infected blood it takes 12 days for the germ to be absorbed and carried by the general circulation to the salivary glands? This is against analogy and probability. It seems more reasonable to suppose that the germ undergoes a cycle of changes necessary to its reproduction and perpetuation; thus we know that, in malaria, the protozoon absorbed by the mosquito from a malarial patient undergoes certain metamorphoses which seem to insure its fecundation and reproduction.

The mosquito being once infected remains so, in all probability, to the end of its life, with the power of infecting an unlimited number of patients; thus, one is on record as having bitten a non-immune and produced yellow fever on the 59th day from its infection.

That an infected female transmits the germ to its progeny, through the eggs and larvae, is not in itself probable; there is nothing in the experience of the sanitary medical officers in Havana to give ground to such hypothesis, and Guiteras has shown by direct experiment that the offspring of an infected mother are completely innocuous.

What is the nature of the poison of yellow fever? The germ, contagium or poisonous principle of this disease has not yet been found, and its nature and character remain unknown. The bacillus of Sanarelli has been proved to be nothing but a product of decomposition, a fact now admitted by Sanarelli himself. That the germ exists in the blood has been proved by Reed, Carroll and Agramonte who produced six cases of yellow fever by the direct inoculation of infected blood from patients to non-immunes; and yet, cultures from the same blood made by these expert bacteriologists have failed to show bacteria or organisms of any kind. The thought naturally suggested itself that the contagium was ultra-microscopic, beyond the ken of our most powerful instruments. To prove this, Dr. Carroll drew blood from a yellow fever patient, let it coagulate, and pipetting out the serum, filtered it slowly through a new Berkefeld laboratory filter previously sterilized. This filter prevents the passage of the smallest known bacteria. In order to prove that his filtrate from the serum was bacteria-free, Dr. Carroll, after again sterilizing the filter, passed through it a recent bouillon culture of *staphylococcus pyogenes aureus* and, from the filtrate, was unable to obtain any growth of that bacterium in flasks of bouillon incubated at 37° C.

Dr. Carroll injected 3 non-immune American soldiers with this bacteria-free serum, and two of them had a typical attack of yellow fever after an incubative period of four days. It is therefore proven that the contagium of yellow fever exists in the blood, in the serum as well as in the cells; that it is ultra-microscopic and that until the power of our instruments has been greatly magnified all search for it will be futile. In that respect it is analogous to the contagium of the

foot and mouth disease of cattle and that of several common specific diseases such as small-pox, scarlet fever and measles. It may be a virulent toxine held in solution, or else an exceedingly minute organism. There are symptoms which suggest a toxine, but stronger reasons in favor of an organism which, however, may itself secrete a toxine; some of these reasons are the following: 1st. It seems hardly possible that a toxine absorbed by the *Stegomyia* from a yellow fever patient would require 12 or more days to reach the proboscis of the insect, or that, in the case of *Culex* mosquitoes, it should not reach the salivary glands at all. 2d. Reed and Carroll have shown that blood heated for 10 minutes at a temperature of 55° Cent. loses its infectious principle; now toxins are not known to be affected by such low temperature, while bacteria are much more sensitive. 3rd. The same experimenters succeeded in infecting a non-immune with the blood of one of the cases produced by the inoculation of filtered serum, and they contend that a toxine which has undergone such great dilution in the body of the second individual would be incapable of producing the disease.

That the mosquito is the intermediate host of the specific contagium of yellow fever must be admitted, but it is still claimed by many that the bite of that insect is not the only means of transmitting the disease. We have all been taught that the infection of yellow fever is in the air, that it proceeds from the body of the patient and clings to his bedding and clothing, his room and all objects contained therein, and abundant observations have been, and are still, adduced to prove this contention. Errors inculcated by generations of teachers are deeply implanted and not easily shaken. To uproot them requires violence to old prejudices, much determination and perseverance. It is the privilege of this Congress to clear the field of much rubbish by its official recognition of what is established truth and repudiation of exploded beliefs, the unhealthy growth of popular ideas uncontrolled by scientific experiment.

The experiments of the yellow fever commission at Que-

mados in 1900 and 1901 proved most conclusively that fomites, that is the clothing and bedding of patients, are absolutely harmless and incapable of infecting anybody. Seven non-immunes (Spaniards and Americans) were kept for several weeks in a room littered with most foul fomites, dressed in the very clothing, sleeping in the very sheets and beds of deceased patients, and came out of the ordeal in perfect health. One of them was subsequently bitten by an infected mosquito and promptly developed yellow fever, thus proving his previous non-immunity.

As this question was one of great importance, Major Gorgas, Dr. Ross and myself thought wise to continue the same line of experiments at Las Animas Hospital, not to verify those of the commission which carried conviction in themselves, but in order to give all physicians in Havana an opportunity to see and convince themselves. To that end, invitations were sent to all the prominent members of the profession to visit Las Animas and watch the experiments which were carried on, under the able direction of Dr. Ross and Dr. Biada, from Sept. 27th until Nov. 5th, 1901. Two non-immunes at a time were kept in the experimental room for a week, until four sets of 2 men, or 8 men in all, were thus subjected to the supposed infection. In the experimental room was brought, at various times, a large quantity of dirty clothing and bedding proceeding from the yellow fever camp at Columbia Barracks, 2 cases treated at "La Benefica," one of which died, and from another fatal case treated at Las Animas, the diagnosis in each of these cases having been established by the official commission. The eight non-immunes, subjects of these experiments, preserved excellent health while in the infected room and during the time (at least a week) they were kept under observation afterward. It is then clear that evidence of the most conclusive kind exists that yellow fever is not communicated by fomites, evidence which must now be accepted by all candid inquirers after truth. All those observations which connect outbreaks of yellow fever with infected clothing or baggage, if reconsidered in the light of our pres-

ent knowledge, will be found, if correctly recorded, to be always reconcilable with the doctrine of mosquito transmission. When we reflect on the length of time (six to eight or more weeks) pathogenic mosquitoes may live, and how difficult it is to diagnose a very mild case of fever which may unsuspectingly infect a new set of mosquitoes, many obscure cases of yellow fever on land or sea cease to be unintelligible and inexplorable.

PREVENTION.

Now we are prepared to consider the more practical and useful aspect of our subject, namely the prevention of yellow fever. Very naturally this is best accomplished by the destruction of the agent of transmission; let us destroy the *Stegomyia* and yellow fever will disappear as surely as does malarial fever upon the killing of the *Anopheles*; indeed, more surely, since malarial fever may recur in a once infected person without new poisoning by the insect. The extermination of mosquitoes, or of any one species in any locality, is difficult, well nigh impossible. These insects have means of perpetuating themselves until recently but little suspected and which give them great advantages in the struggle for life. These means are: 1st. Hybernation, whereby, at least in warm and temperate countries, full grown mosquitoes, especially fertilized females, live through the winter in sheltered nooks and corners; it is hard to understand how these fragile insects can survive the winter of the arctic circle where they swarm during the brief summer; it is probable that there they are more dependent on the next two means for their perpetuation. 2nd. The hybernation of larvae in ice, whereby larvae frozen in ice retain their vitality for an indefinite time and, on thawing out, go on to their complete development. 3d. The wonderful vitality of the eggs which resist the droughts of tropical climates as well as the long winters of northern countries, in both cases hatching successfully as soon as brought under favorable conditions.

These natural means of preservation show how difficult it is to exterminate mosquitoes; but if we bear in mind that

they cannot breed or live away from water, much can be done to reduce their numbers by the drying of all stagnant pools or the application of a thin film of oil on the surface of waters which cannot be drained. If a general fight against mosquitoes is thus waged, especially in towns, it will almost certainly strike the *Stegomyia fasciata* which is one of the most vulnerable.

Still more efficacious than the attempt to destroy the *Stegomyia* is to prevent it from becoming infected; unless it has sucked the blood of a yellow fever patient it is just as harmless as any *Culex*; therefore one of the measures most clearly pointed out is to prevent mosquitoes from having access to patients by protecting the latter with window screens and mosquito bars. Any patient thus protected during the infectious stage (first 4 days) is entirely innocuous; the only danger is from the mosquitoes which bit him, and other infected mosquitoes, still lingering in the room or adjoining apartments. Therefore fumigation is always necessary as soon as the patient is able to leave his room; this fumigation should comprise not only the patient's house but also extend to the immediately adjoining buildings so as to reach all mosquitoes which infected, or were infected by, the patient. This is based on the principle that each house breeds its own mosquitoes and that these seldom fly far away. For reasons already stated, if a patient is moved away after the 4th day of the disease from the place where he contracted it, the house he is taken to need not be fumigated.

Taking the word infection in its ordinary sense we now know that it is impossible for any house to be infected with yellow fever; it may harbour infected mosquitoes but, these once driven out or destroyed, it remains entirely free from the contagium of the disease. Therefore whenever, in this paper, a house, ship or place is spoken of as "infected," it simply means that said house, ship or place contains infected or pathogenic mosquitoes, only that and nothing else. If there is no infection there need be no disinfection; all that is required is the destruction of the intermediate host, *Stegomyia fasciata*.

and this is best effected by fumigation, either with sulphur fumes, formaldehyde gas or the smoke of Pyrethrum powder. That this fumigation is all that is required has been demonstrated in the city of Havana where, during the past year, all houses having yellow fever cases were chiefly treated with the smoke of Pyrethrum powder, the result being that, in hardly any, did secondary cases occur. It is exceedingly improbable that such smoke could kill bacteria or destroy any form of specific infection; its action therefore must have been entirely upon infected mosquitoes. To conclude this part of my subject, I think I am justified in saying that the disappearance of yellow fever from Havana is due to the incessant battle of the chief sanitary officer and assistants against the *Stegomyia fasciata* and the use of effective screens around patients.

QUARANTINE REGULATIONS.

Not only has the discovery of the agency of the mosquito in transmitting yellow fever called for radical changes in the prevention and treatment of the disease, but it must also revolutionize the quarantine measures intended to exclude it. The subject of quarantine is one of especial interest to this Congress, since it is of such vital importance to the commerce of the various countries represented by its members. It will doubtless be discussed by other writers, but it seems desirable that it should be considered from all points of view, by as many members as possible, in order that this Congress may be enabled to take such official action and pass such resolutions as are demanded by the present status of sanitary science, the interest of public health and the needs of commerce.

Quarantine measures are necessary at the port of departure as well as at the port of arrival; at the port of departure so as to exclude the infection from shipboard; at the port of arrival, to prevent any infection which may exist on shipboard from spreading on land.

MEASURES AT THE PORT OF DEPARTURE.

To keep yellow fever from shipboard, two things are required: 1st, to exclude infected mosquitoes, 2d, to exclude

persons in the incubative period of the disease, that is, persons who have been infected less than five days previous to their embarkation. It is generally impossible to determine whether non-immune passengers have been so exposed as to make it probable that they are infected; even if living in an infected locality they may have been thoroughly protected by screens or mosquito bars. Therefore this matter must be left largely to the judgment and discretion of local quarantine officers rather than be regulated by some central authority having no knowledge of local conditions and circumstances. The only certain way to exclude all infected passengers (within the incubative period) would be to keep them under observation for five days before embarking, a very irksome measure, involving much loss of time and money and only to be employed in extreme cases. The aim of modern quarantine is to render intercourse between nations as easy and inexpensive as possible. I see no serious reason for not embarking all non-immunes, whatever the exposure may have been, who at the time of embarkation have none of the preliminary symptoms of the fever. It is so easy to prevent the propagation of the disease on shipboard where, as a very general rule, *Stegomyia fasciata* is absent, that the breaking out of one or even several cases is of no serious import; they can be isolated and screened with the absolute certainty that no secondary cases will result from them.

The exclusion of mosquitoes from ships is practically impossible if the latter load alongside wharves, but comparatively easy if they load by means of lighters in mid-stream; in this case the danger of harboring infected mosquitoes is very small, in fact a negligible quantity. The belief, tenaciously held that, in an infected port, yellow fever is particularly rife along wharves was evidently based upon the other erroneous and exploded belief that it was a filth disease and that wherever the air is filled with the odorous emanations of decayed animal and vegetable matter, there, necessarily, thrive and multiplied the dreaded germ. We have learned better; we now know that yellow fever is found chiefly in

dwelling-houses and that wharves are comparatively free from pathogenic mosquitoes. However, there are exceptions to all rules and wharves may be so situated as to be easily infected. As a practical rule for our guidance, in case of ships loading alongside wharves in an infected town, I would suggest that, after loading, they be required to cast loose and anchor at some distance from the shore, there to be inspected by an authorized quarantine officer who, after examination, will decide whether fumigation is necessary and, if so, in what parts of the ship. This fumigation, as we know, can be accomplished in a few hours without detriment to property or serious hardship to anyone.

MEASURES AT THE PORT OF ARRIVAL.

All ships arriving from non-infected ports, although these may be within the epidemic zone of yellow fever, should not be subjected to any detention; in this manner would successful measures of sanitation in any country be recognized, appreciated and made profitable.

Any ship which arrives from an infected port after a voyage of five or more days without any case of fever may also be released without detention provided no *Stegomyia fasciata* are found on board. In such case, great care will be required to ascertain that all the non-immune passengers are entirely free from fever by taking the temperature of each one. We know that cases of yellow fever may be so mild that even the patients do not realize they are ill until their temperature is taken; from such ambulant cases the spread of the disease is most to be apprehended.

When a ship arrives with yellow fever patients aboard, several possibilities suggest themselves. If all these patients developed the disease within five days after sailing, it may be assumed that they contracted it before coming aboard and that the ship is probably free from infected mosquitoes. If one or more patients developed the disease after five days, it is almost certain, and after six days absolutely certain, that the infection occurred after sailing and that pathogenic mosquitoes are present on shipboard. In either case the patients

should be landed and isolated, and the forecastle and cabins fumigated. The well non-immune passengers may, in the first case, be discharged upon the completion of the period of five days from the date of departure, provided the presence of *Stegomyia fasciata* can be reasonably excluded; but, in the second case, they must be held for five days from the time they leave the ship.

As to the ship's cargo, the conviction seems to be growing among sanitarians that it is incapable of conveying any kind of infection, and that its disinfection for any disease is very seldom called for. In yellow fever, however, the treatment of the cargo must be based on special principles. If the ship was loaded alongside a wharf in the vicinity of infected houses, and made the trip in 3 or 4 days, or less, there seems to be no reason why the hold could not harbour infected mosquitoes and, in my opinion, should be fumigated, as well as the forecastle and cabins, unless this measure has already been taken at the port of departure or during the trip. It is held by Reed, Carroll and other experimenters that the *Stegomyia fasciata* cannot live more than 3 or 4 days without water and that in any voyage lasting 4 or more days, no mosquito of that species will be found alive in the hold of the ship (if dry) or in the baggage of passengers. Therefore they contend, with much logic, that under these circumstances any fumigation is entirely unnecessary. On the other hand, I have been informed by a trustworthy medical officer that on opening his trunk in New York, ten days after closing it in Cuba, he saw three mosquitoes fly out of it. Perhaps they were not *Stegomyia* and belonged to a more hardy species. However it may be, this matter of the longevity of mosquitoes in confinement, without water, is very important and should be conclusively settled. Fortunately it is of very easy demonstration and need not materially retard the enforcement of the new measures which must soon be inaugurated.

A VACCINATION LESSON OF THE LATE CIVIL WAR, DURING THE SIEGE OF CHARLESTON, S. C.*

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LATE SURGEON UNITED STATES ARMY.

IN THE Autumn of 1862 small pox broke out in Norfolk, Va., and assumed such proportions that the late Henry A. Martin, M. D., of Roxbury, Mass., was employed to superintend vaccination of the soldiers and civilians of Norfolk and vicinity. Dr. Martin is the best recognized authority on vaccination that the century has produced since Jenner, and was the first to introduce animal vaccine into America. Under his supervision the epidemic soon ceased.

During the winter of 1863 and 1864 we had about 1500 infantry, more or less actively engaged in the siege of Charleston, S. C. Not a case of small pox had occurred on the island. Under my supervision at this time was the First Regiment of North Carolina Volunteers, afterwards known as the 35th U. S. Colored Troops, James C. Beecher, Colonel. When the regiment was ordered to the siege of Charleston, a detachment remained in Norfolk. These men numbering 110 under the charge of an officer were sent, January 31st, on a small sailing vessel to rejoin their regiment on the island. En route one man died, and no report was made, since there was no medical attendant on board. These men seemed well on arrival, save the discomfort of the rather long, tedious winter voyage. They were at once consigned to their respective companies without any special examination.

February 8th one of these men reported at sick call, a serious sufferer with headache, backache, fever, etc.; no eruption and no thought of smallpox. Of this detachment, by noon the

*Read before the Commandery of the Loyal Legion, at Boston, February 4, 1902; publication requested by unanimous vote.

following day, 15 men were taken very ill. A careful study of these cases caused me to become assured that they were ill with smallpox. I then learned for the first time that the man who died en route had been taken in a similar way and was broken out with an eruption before his death, hence, all too clearly was the evidence of a like exposure of all this detachment of men.

"What was to be done?" The news had spread like wildfire through the entire command, and a panic, almost approaching insubordination, ensued. Receiving from my Brigade Commander full authority, I at once established an isolated camp and removed every man belonging to the detachment into it. I set up an ample number of hospital tents and detailed a medical officer to take charge of these.

Dr. DeGrasse of Boston, my efficient assistant, and myself carried the sick men on stretchers and placed them on beds prepared for their reception. This we were obliged to do personally as not a soldier could be induced to touch the sick. My next duty was to look for vaccine virus. I found I had a few crusts put up in wax and issued by the medical department, but these, at the best, I knew were of small value. A number of men protested that they should not be required to enter the isolated camp, as they had recently been vaccinated at Norfolk; and in attestation showed me their arms still sore and, fortunately, carrying large crusts, demonstrating the value of their vaccination. Joyfully I accepted these as a godsend of protection, carefully made them into a thin paste with glycerine, and Dr. DeGrasse and I began our work of vaccination, commencing with ourselves. All night long the dusky procession passed in bare-armed review, and before noon the next day the eight hundred men of the regiment had been carefully vaccinated by us. Weary to exhaustion we at last sought rest.

Then came the cleaning of camp, to which every one gave eager aid, and in another day we were undoubtedly the cleanest regiment on the island. The one man hardest to control was the Assistant Surgeon, detailed in charge of the isolated camp. To my astonishment he coolly walked into my

quarters the following day and demanded to be relieved of this irksome task. The return to his post of duty was made emphatic with the added instruction that the patrol was ordered to halt, and, if not obeyed, to shoot the man who attempted to leave camp, and to this order there could be no exception. This was the last time I saw the poor fellow, who resigned his commission later in the year, but his requisitions were filled to the letter.

It is needless to say that the two weeks following were days of great anxiety. Careful inspection of arms and revaccinations were made the most important of daily duties. At last the dreaded period of danger was ended. Not a single soldier of over eight hundred thus exposed to the dread disease had even the slightest attack of varioloid, and when, some days later, we sailed away en route for an expedition to Florida, it is safe to believe that I was the happiest man in the entire command.

But what of the detachment left behind in the isolated camp? Out of a total of one hundred and ten men over eighty took the disease and forty deaths attested the virulence of the dread scourge which, with a singular fatality, for the centuries before Jenner, swept the civilized world.

It is probably not generally known that, during the regime of slavery, the owners, in most instances, deliberately preferred not to vaccinate their slaves, trusting to the security of isolation incident to plantation life.

I have made this hitherto unpublished contribution to medical military history, not solely because of its local interests, but more especially as a series of graphic facts which teach the value of protection derived from vaccination in a way that civil life could hardly render.

This generation has become so immunized from the severer forms of smallpox, because of vaccination that few, even of the medical profession, can now realize the precious boon which Jenner conferred upon the race. It is to such ignorance alone that can be attributed a prejudice against proper vaccination and the insistent attacks that have been made against its enforcement.

MILITARY HYGIENE IN THE TROPICS.

BY CAPTAIN CHARLES EDWARD BELIN FLAGG,

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

IN VIEW of the fact that a large part of army service will be tropical service, the question of how best to preserve the health of troops and individuals in the tropics, is of importance.

The subject will be discussed under the following divisions:

- A. Selection of men for service in the tropics.
- B. Prophylactic measures applicable before embarkation.
- C. Acclimatization; Diseases to be guarded against.
- D. Clothing.
- E. Food and water.
- F. Shelter and disposal of wastes.
- G. Work, recreation, habits, etc.

(A) *Selection of men for service in the tropics.*

According to existing regulations and customs of the service much discretion is left to regimental and company commanders as to the selection of men to be taken to the tropics and after the arrival of the organization at its destination the recruiting officer has the responsibility of choosing men to supply the places vacated by retirements, discharges and deaths.

The minimum age for enlistment is fixed at 18 years. No minimum weight is prescribed for cavalry and light artillery and the maximum weight for infantry and heavy artillery is fixed at 190 pounds.

There is at present no maximum age limit for enlisted men for service in the tropics and officers over 60 are not debarred from active duties in the field.

Bearing in mind the exceptional physical and mental strain that our soldiers are likely to be subjected to in the tropics only those men most fit to endure such strain should be selected.

First as to age: ² "The most effective armies are those in which the youngest soldiers have been over twenty-two years of age. At 18 the bones are not fully formed, nor do the muscles reach their mature growth much before twenty-five years; while thus undeveloped and immature, as they must be at eighteen years, it is useless to expect any long-continued exertion or energy from men at that age. If enlisted, the state should recognize this, and suit the work to their strength; at eighteen, recruits have not only to work, but to grow and develop, and they should have precisely the amount of exercise and kind of work best fitted for them."

If such an undeveloped boy is taken to a station within the United States where the climate and surroundings are not wholly unlike those to which he has been accustomed, the training to which he is there subjected will probably aid in his development. Should he be taken to the tropics, however, where his surroundings are entirely new, where the climate is not only enervating but frequently insalubrious, he will most probably be unable to endure the service required of him, especially if this service entails much night work, frequent marches in the sun and rain, and constant alertness and mental tension, such conditions as at present obtain in the Philippines.

Granted that the best work and greatest number of days of duty can be obtained from men over 20, there will still be many recruits under that age sent to the tropics as the recruiting officer must accept boys from 18 to 20 years old if they otherwise fulfill the legal requirements.

The following quotations from ³ *An Epitome of Trippler's Manual and Other Publications on the Examination of Recruits*, has especial force in relation to tropical service. "Should a minor offer the written consent of parent or guardian, the question then presents itself whether so young a person possesses the vigor and physical development necessary for the performance of all the duties of a soldier.

"Youth, being the period of active growth for body and mind, should be passed under conditions that will secure to it the proper amount of food, exercise and rest, in order that its growth may be healthy. These cannot always be obtained in the military service, the exigencies of which may be such as to test to the utmost the endurance of the soldier when subjected to the hardships of extreme exertion, inclement weather, loss of rest, and privation of food incident to many campaigns. Under such circumstances the staying power of the immature youth is found wanting. His undeveloped body yields to the strain, and a consequent permanent disability leads to his discharge from the army. As all military experience confirms this, and as the opinion is almost universal that youths are not fit for the duty our soldiers are called upon to perform, their enlistment should be discouraged save in cases where their physical development is exceptionally good and they display a true aptitude for the military service."

Recruiting officers should be thoroughly familiar with this manual.

Under present conditions, the medical examining officer will frequently be more or less unfamiliar with the amount and character of the work required of the soldier, and when this is the case, the recruiting officer should not only be present at the examination, as required by Army Regulations, but by questions and suggestions impress upon the medical examiner the importance of his duties.

The following points require especial consideration:

(a) Diseases of the skin or a tendency thereto.

(b) Defective teeth. ⁴ "If several of the teeth are decayed, especially about the crown, it is probable that before the expiration of enlistment they will be so far destroyed as to render mastication imperfect; hence men who have lost the front teeth from decay and have many unsound back teeth should be rejected. The loss of the front teeth through accident is not cause for rejection, provided a sufficient number of the back teeth are sound.

Unless an applicant has at least four sound double teeth,

one above and one below on each side of the mouth, and so opposed as to serve the purpose for mastication, he should be rejected."

The question of proper mastication is not the only one to be considered in relation to the teeth; and as the loss of the teeth through decay sometimes denotes previous ill health it is a safe rule to reject applicants with artificial teeth.

(c) Relaxed or patulous inguinal rings, not ordinarily a cause of rejection, should as a rule debar from this service.

(d) Hemorrhoids of any kind, should be a cause for rejection.

(e) Varicocele of any degree should reject.

(f) Varicose veins sufficiently large to be noticed should be cause for rejection.

(g) Deformed and defective feet, including overriding toes, corns if at all severe, ingrowing nail, and bromidrosis or stinking, sweating of the feet should reject. Besides this care in the selection of recruits especial precautions should be taken to exclude from this service all old soldiers who are unfit.

On the receipt of the order for service in the tropics the surgeon should be required to make a thorough examination of the command and to report all men considered unfit for tropical service with his reason, in each case, for considering them unfit.

While some maximum age limit should be fixed for tropical service this limit might well be exceeded in the case of general officers and on the other hand some soldiers will be found, who, although younger in years than the maximum age limit prescribed, are histologically and therefore physiologically older than the limit. It is said that a man is as old as his arteries and it is frequently found that the changes in the tissues, normal to advanced age, have occurred at an earlier period than is usual.

What this age limit should be, I will not attempt to state, although I am inclined to believe it should be between 45 and 50, certainly not over 50.

For French soldiers ⁵ the "inferior" age limit has been fixed by Burot and Legrand at 22 and this, they state, is the inferior age limit for soldiers sent to the tropics by the English, Spaniards and Dutch.

These authors consider 40 as an extreme maximum for privates in the tropics.

It would be better if the surgeon who is to examine the troops before embarkation had served for some time previously, with them, and, in any case, the medical history of the soldier, as obtained from the records and from the statements of the man, should be considered.

The men found incapacitated could be disposed of as their cases demand, being discharged on Surgeon's Certificate of Disability, transferred to home battalions and squadrons, etc.

The question of the proper disposition of noncommissioned officers and veteran privates too old for service in the tropics must be considered sooner or later by Congress, and the sooner such action is taken the sooner will the sick and death lists in the tropics be reduced. Noncommissioned officers are now transferred to home battalions without reduction and this is a step in the right direction.

Having carefully excluded all men unfit, or likely soon to become unfit, for this service, the next points to be considered are:

(B) *Prophylactic measures applicable before embarkation.*

The precautions now ordered to be taken to guard against smallpox would seem to be sufficient, and if the existing orders on the subject are faithfully and intelligently carried out, nothing more can be done to guard the command against this disease.

The men are first examined at their home stations by medical officers and those not already protected by a recent successful vaccination are vaccinated. This examination and vaccination is repeated at the port of embarkation, possibly on the voyage, and after arrival at the port of debarkation. In the Division of the Philippines, G. O. 31, Hdqrs. Dept. of the Pacific and 8th A. C., Manila, P. I., November 19, 1898,

requires that each enlisted man not successfully vaccinated within the preceding six months be vaccinated and if this vaccination prove unsuccessful that the operation be repeated at intervals of two weeks as often as necessary, in the judgment of the surgeon, to protect against smallpox; and if unsuccessful, at least three vaccinations in succession must be made before the soldier should be considered protected.

Protective inoculation against typhoid fever has been practiced with some success in the British army but has not as yet been adopted in our army.

Protective inoculation against yellow fever is, it is hoped, to be looked forward to as a measure of utility, but is not now generally accepted as an assured fact. Protective inoculation against bubonic plague would probably be made in troops sent to infected localities, as this measure is no longer in the experimental stage.

The subject of venereal disease deserves some notice although with the excellent hospital facilities of our transports these cases fare better than formerly when some of the ships hired as transports furnished not only poor hospital facilities but also insufficient cubic space per well man. However it is advisable to prevent venereal contagion as much as possible, for the good of the soldier en route as well as when he experiences the enervating conditions in the tropics.

Seaports have, admittedly, a large percentage of venereal disease among prostitutes and the men should be warned of this danger and as much restriction placed upon them as the length of stay at the port renders admissible.

Instruction of the soldier in the avoidance of the lowest and dirtiest class of prostitutes, in temperance and personal cleanliness, would do much towards avoiding venereal disease. This instruction might be given in the form of a printed circular.

It is not uncommon to find the genitals of men admitted to hospital, in a filthy condition. Plain directions concerning this matter should be given to soldiers. They should be informed that secretions retained underneath the foreskin ren-

der the tissues peculiarly vulnerable to any infection with which they may come in contact, and that these parts should receive frequent washings in soap and water, the foreskin being retracted for the purpose.

Restriction and discretion in the granting of passes will also minimize the danger of the occurrence during the voyage, of other contagious diseases.

(C) *Acclimatization* has been a subject for much discussion and as intelligent treatment of the matter requires an intimate knowledge of the physiological reaction of the human machine to the most varying conditions, there is still a wide field for investigation along this line. Mark Twain's picture of the "Acclimatized Citizen" shows what acclimatization is not. The subject of the picture is a tall, lean, stooping figure, skin of a dark yellow hue, the enormous spleen forms an "ague cake" plainly to be seen enlarging the already distended abdomen, the eyes are haggard and the general expression is of one who gets hot but can't get warm, and cold but can't get cool, and is distressing in the extreme. Acclimatization is not an acquired resistance to endemic disease but is rather an adaptation of the economy to altered climatic conditions. This and nothing more.

One method of acclimatization is in accordance with the Darwinian law of survival of the fittest. All the members of the community not capable of enduring the climate die in time and the survivors will then form an acclimatized class. This method need not be considered at this time in connection with our army of occupation.

According to Notter and Firth ⁶ "From the results of a long extended inquiry into the effects of climate on different races of people, Stokvis concludes that the power of resistance of the healthy adult European living in the tropics quite equals, and in some measure is even superior to the vital power of the native races. On the other hand, there are certain peculiarities of the race which have been gradually acquired by inheritance from generation to generation and that the longer the European resides in the tropics the more likely is he to lose

his superior resisting powers; and it is possible that the European creole is both bodily and mentally inferior to the European."

It is then seen that residence in the tropics does not induce immunity against so called tropical diseases, and it has been found that the functional changes that take place, as for instance, increased action of the skin and diminished activity of the lungs, are readily and rapidly accomplished, and that therefore, no preparatory residence in a warm climate is required. It would, however, perhaps be unwise to send troops directly from Alaska or extremely cold stations to the tropics.

The Diseases to be Guarded Against are: malarial fevers, dysentery, diarrhea, insolation and calor morbus, typhoid fever, leprosy, skin diseases and intestinal parasites, yellow fever, and bubonic plague.

Malaria is caused by the introduction into the body of the malarial organism, the plasmodium malariae. A frequent and possibly the exclusive method of introduction of this organism into the system is by the bite of a mosquito that has previously bitten a malarial patient. It is to be noted that infection of the mosquito from a malarial patient is necessary to enable it to transmit the disease, and, further, that only certain species of mosquitoes are capable of nurturing and transmitting the plasmodium.

The predisposing causes of this disease are the conditions favorable to the growth and propagation of the mosquito, and all causes tending to depress the vitality of the body, notably chilling.

According to our present knowledge of this disease the most universally applicable measure for its prevention is the absolute protection from mosquitoes. That this measure is both feasible and effective has been demonstrated beyond

NOTE.—In the discussion of the paper Contract Surgeon Scherrer, U.S.A., remarked on the efficacy of the application of coal oil or crude petroleum to the surface of ponds and other bodies of stagnant water in preventing the hatching of the ova of mosquitoes, one of the most important features of prophylaxis known at the present time.

question of doubt. Exclusion of mosquitoes in barrack will be discussed later on. Protection against mosquitoes outside of habitations during the day is scarcely needed as the mosquitoes to be avoided are nocturnal in their habits. Protection of men on guard and other duty during the night may be secured in some degree by having the hands covered and by allowing a growth of the beard to protect the face. The exposed portions of the face may be smeared with oil containing pennyroyal, lavender or some such substance repugnant to the mosquito. One half gram (eight grains) of quinine taken every second day will ward off attacks of fever in most instances but is only to be recommended where protection from the mosquito can not be secured. The habitual use of quinine has a deleterious action on the system.

Dysentery is caused by the amoeba dysenteriae, by bacteria and possibly by the effects of cold, in chilling the body, without the agency of bacteria or amoebae.

The pathogenic bacteria and amoebae are ingested with the food and water and possibly with dust. Flies spread the contagion.

Prophylaxis consists in care in preparing and serving food, in avoiding contaminated water, chilling of the body and uncleanness.

Diarrhea is a symptom of many diseases and is frequently caused in the tropics by the ingestion of improper food, by depression and relaxation of the system by prolonged heat and by chilling of the body.

Insolation, sunstroke or heatstroke is due to the effect of moist heat, and calor morbus, heat sickness or heat exhaustion is due to a usually more prolonged and perhaps less violent action of the same causes.

Prophylaxis is to be procured by proper clothing and exercise.

Typhoid fever is not peculiar to the tropics, as every one knows, but occasionally it becomes very virulent among troops serving there.

The same prophylactic measures applicable everywhere else for this disease are also applicable in the tropics.

Leprosy deserves attention in connection with the fact, known and recorded, in the time of the ancient sanitarian, Moses, and since many times confirmed, that a house may become infected by residence therein of a case of the disease. It resembles in this respect, tuberculosis.

The etiological factor is the bacillus leprae and the disease is transmitted rather by prolonged contact with infective material than by a single short exposure.

Skin diseases of various kinds are troublesome in the tropics.

The increased action of the skin renders it extremely susceptible to irritation from insects and ascomycetes, and the skin having become injured by these causes is frequently attacked by ubiquitous bacteria.

Furuncles or boils, phlegmon, carbuncle, oriental sore or tropical ulcers; and grave general infections may then occur.

Dhobie or washerman's itch caused by the trichophyton and other fungi, is annoying in the extreme, and pemphigus, characterized by a bullous eruption, is also frequently encountered.

An enumeration of all the skin diseases met with in the tropics is not within the scope of this paper.

Prophylaxis consists in especial care of the skin, particularly in regard to cleanliness. The clothing must be suitable and while being cool must thoroughly protect the skin.

Clothes must frequently be washed and boiled, and this holds good for all clothing coming into contact directly or indirectly with the body; bedclothing and outside clothing as well as underclothing.

The intestinal parasites of the United States and some others are found in abundance, and the greatest cleanliness is therefore necessary in the preparation of food eaten raw.

NOTE.—Since writing the paper I have seen a report of 1st Lieut. Richard P. Strong, Asst. Surgeon, U.S.A., mentioning the presence of ankylostomiasis in the Philippines. Quite a number of cases have since been reported in the United States.

The ankylostomum duodenale, first found to be the cause of serious disease in laborers in the construction of the St. Gothard tunnel, is found to be widely disseminated in Porto Rico and may be present in Cuba and the Philippines. These parasites attach themselves to the lining membrane of the duodenum, the upper part of the intestinal tract, and produce a grave degree of anemia in their host.

Dogs are frequently carriers of the ova of intestinal parasites and transmit them to man by licking his hands or clothing; or the ova may be deposited on the hair of dogs by licking and then to the hands and mouths of men caressing the dogs.

The prophylactic measures to be observed against yellow fever *are well known and it is hardly within the scope of this paper to discuss its etiology or the value of prophylactic inoculation of serum.

Bubonic plague is caused by the bacillus pestis which gains entrance to the system through abrasions of the skin, usually of the feet of bare-footed natives, and of the hands of others. It is possible that infection may also take place through the respiratory tract. The role of rats in the spread of the disease has been widely discussed and it is believed that the fleas on the infected rats take an active part in disseminating the plague.

(D) The *Clothing* now furnished soldiers for service in the tropics is, on the whole, well adapted for the purpose.

It is conceded that in the tropics the body of the soldier must be thoroughly protected but must not be warmly clad. The clothing must be light. Under no circumstances should soldiers be permitted to discard any part of their underclothing as they are essential for the protection of the body.

The value of the abdominal bandage has been demonstrated, and it should consist largely of wool.

From personal experience and observation I am of the opinion that a modification of the heavy blue flannel shirt

*The discovery of the transmission of the disease by mosquitoes (*Stegomyia fasciata*) and as fully discussed in the article by Col. Havard in this issue of the JOURNAL, was made after the preparation of this paper.

now issued, if worn during the night as well as during the day, or at some stations, only during the night, will take the place of the abdominal bandage and prove as effective as the bandage in preventing chilling of the abdominal organs and consequent intestinal troubles. The light weight blue flannel shirt now issued may be satisfactory for this purpose. I have not seen the shirt. The tails of the heavy weight shirt need to be at least four inches longer thoroughly to protect the abdomen.

If worn as an outer garment the color of this shirt makes the wearer conspicuous and therefore more or less unhygienic in an engagement.

The attempts to secure a suitable sweat-proof khaki-colored dye for woolen material have not as yet, so far as I know, been crowned with success.

The thin sleeveless cotton undershirt and thin cotton drawers are suitable for tropical wear.

The shoes should fit the feet and should be soft and pliable. A tan shoe of excellent quality has been issued, but, in my opinion, the problem of properly fitting the feet has yet to be solved.

The best type of head dress is a light, ventilated, cork, straw, or pith, helmet that sits easily but securely on the head and affords protection to the eyes and nape of the neck. During active operations the cork helmets issued to our troops have been found to have their disadvantages, and the men, if given their choice, will select the soft campaign hat in place of the stiff and cumbersome helmets. Protection of the head from the heat of the sun is so essential to health in the tropics that the head dress that best subserves this purpose must be selected, and the campaign hat, well tried and serviceable though it is in temperate climates, must, to a large extent, be, in the tropics, displaced by the helmet.

The color of the clothing should be such as to absorb as few heat rays as possible. Therefore white is preferable and when military necessity contraindicates this our khaki is next best.

No portion of the uniform should constrict the body at any point and when soldiers are seen buttoning up their blouses on the approach of an officer it may be known that the blouses are uncomfortable or too tight. This is true in any climate, but the results of tight clothing will be most harmful in a hot climate. The care of the clothing requires attention. No part of the clothing worn during the day should be worn at night and the underclothing should be laundered at least twice a week. It is important that the clothing be boiled when washed and in this manner sterilized. The native washers will not do this unless required to.

Dhobie itch, already alluded to, is very annoying and persistent, especially when attacking the skin of the crotch, and may be prevented or its cure favored by a daily change of short cotton bathing drawers. The wearing of unboiled underclothes and wearing the same suit of underclothes any length of time without having them washed conduces to the disease.

(E) *Food and Water.*—The ration as issued and cooked in this country is not suitable for the soldier in the tropics, and this has been demonstrated by experience and by a board of officers and scientific deduction.

As the President now has control of the amount and components of the ration a suitable tropical ration will no doubt be issued.

There are still some points to be considered about this question of food.

The greatest care must be exercised in the storing, handling, cooking and serving of food. Where it is impracticable to secure beef on the hoof, refrigerated beef will be found as nutritious and digestible and only slightly less good in keeping qualities, after thawing, than fresh beef. Where abundance of ice is not procurable meat should not be kept for any length of time, and hashes, ragouts, etc., should not be made of left over scraps of cooked meat. All food and meat especially, must be carefully protected from the flies before being cooked, during cooking and while being served.

The ideal ration as given by Munson⁷ is as follows:

ARTICLES.	QUANTITY PER RATION (ounces).	PROTEIN, gm.	NITROGEN, gm.	FATS, gm.	CARBOHYDRATES, gm.	FUEL VALUE CALORIES.
Fresh Beef (quarters).....	10.0	41.68	6.67	44.75	.....	590
or Fresh Mutton.....	10.0	46.20	7.35	62.90	.....	720
or Pork	6.0	27.54	4.40	112.54	.....	1093
or Bacon	6.0	15.64	2.49	105.06	.....	1012
or Salt Beef	10.0	40.27	6.44	64.68	.....	688
or Dried Fish (cod)	10.0	45.37	7.26	1.13	.....	197
or Fresh Fish, average (whole)	14.0	31.73	5.07	0.79	.....	120
Flour	18.0	55.08	7.90	5.60	380.46	1850
or Soft Bread.....	20.0	53.83	8.61	6.80	299.20	1506
or Hard Bread.....	18.0	73.12	11.74	6.63	371.81	1926
or Corn Meal.....	20.0	50.40	7.99	12.40	425.80	1986
Beans	2.4	15.16	2.42	1.22	40.18	240
or Peas.....	2.4	16.38	2.62	0.75	41.80	246
or Rice.....	4.0	8.75	1.40	0.45	88.87	407
or Hominy	4.0	9.20	1.47	0.67	88.75	430
Potatoes	16.0	9.50	1.52	0.45	81.70	380
or Potatoes 80% & Onions 20%	16.0	8.60	1.40	0.72	73.09	340
or Potatoes 70% and Canned Tomatoes 30%	16.0	8.17	1.36	0.54	65.80	297
Dried Fruit, average.....	3.0	1.77	0.27	1.53	35.80	220
Sugar	3.5	....	....	....	94.25	397
or Molasses	1 gill	....	....	....	56.05	269
or Cane Syrup	1 gill	....	....	....	56.25	269
Coffee, green	1.6	....	....	....	....	....
or Coffee, roasted	1.28	....	....	....	....	....
or Tea, green or black.....	0.32	....	....	....	....	....
Vinegar .....	.32 gill	....	....	....	....	....
Salt .....	.615 oz.	....	....	....	....	....
Pepper, black.....	.04 oz.	....	....	....	....	....
Soap .....	.64 oz.	....	....	....	....	....
Candles .....	.24 oz.	....	....	....	....	....

This, it will be seen, differs from the ration as heretofore issued in a slight increase in sugars and starches and a reduction in nitrogenous and fatty matters.

For an exhaustive scientific discussion of this question the prize essay of Munson may be consulted ⁸ or "The Theory and Practice of Military Hygiene" by the same author.

Bacon should be packed in salt before shipment to the tropics as even well cured bacon, if not so packed, is apt to become rancid. I saw this demonstrated in Luzon. Bacon from the United States of a fine quality and well cured, sent in sacks, became rancid after being kept a time in Manila while the Australian bacon packed in boxes between layers of salt kept indefinitely.

Fresh fish will prove an excellent occasional substitute for beef but the fish must be absolutely fresh and preferably alive when turned over to the cooks.

Flour should be furnished in hermetically sealed packages and if it becomes damp before use it should be dried at a temperature of 100° F to 110° F. If any portion becomes sour this should carefully be separated and discarded. Bread should be carefully protected from dust and germs and should preferably be handled by means of clean gloves rather than with bare hands.

Beans require most thorough cooking and are rather difficult of digestion. They should be served only occasionally and preferably in the form of thick soup with the bean hulls strained out. Peas, like beans, and for the same reason, should not form a constant article of diet. The other substitutes for beans, hominy and rice, are as a rule, not so well liked by the men. As this is largely a matter of habit it may be corrected by attention to the cooking. Hominy should be thoroughly cooked and eaten with bacon or other meat, and rice should be cooked after the East Indian and Southern United States method and not like glue.

Besides, rice may be used to thicken soups and may be made up with tomatoes, okra and other vegetables in a variety of ways. Potatoes and onions should be carefully sorted and decaying ones discarded.

Dried fruit must be examined for worm punctures and shriveling and if shriveled or with worm punctures it should

be condemned. Dried fruit requires thorough cooking. Ripe fruit is not so deadly a poison in the tropics as is sometimes thought, and should replace the dried whenever practicable. Ripeness and soundness must be insisted on if fresh fruits are issued. Most scrupulous cleanliness of cooking and mess utensils, mess halls and surroundings must be enforced and flies rigidly excluded from all food and garbage.

Water for bathing, etc., has already been discussed. The necessity for pure drinking water is indicated by the water borne diseases. While it is the province of the medical officers to determine whether water to be supplied to troops is pure the line officer may, through force of circumstances, be obliged to do this himself.

The impurities in water are organic and inorganic. Sea water is a type of inorganically impure, and water containing the germs of disease of organically impure water. Practically no chemical tests are needed for detection of inorganic impurities as barring sea water itself and brackish water obtained in the vicinity of the sea, inorganically impure water is rare in comparison with organically impure. The physical qualities of potable water are too well known to require discussion in this paper. It may be noted, however, that the odor of impure water may be best detected by heating the water slightly in a nearly full corked bottle and agitating it. Hard water is water containing ten grains or more of CaCO_3 or its equivalent in the earthy bases or their salts, to the gallon. If excessively hard it may produce diarrhea. The test for hard water is the degree with which it forms a lather with soap, and by Clark's process, using a solution of soft soap in methylated spirit and water, standardized, the exact degree of hardness may be determined.

The most harmful organically impure water may be clear, sparkling, tasteless and odorless, and the only sure tests are the bacteriological, in which disease germs are detected in the water, or physiological in which people drinking the water remain well or contract disease. The latter is a costly method and the former can only be done by experts. If a

sample of water contains much organic matter living or dead it may be considered dangerous. There are several simple tests for organic matter. Twenty grams or nearly two tablespoonfuls of a concentrated solution of tannin may be added to a glassful of water. If the water becomes turbid in less than an hour it should be rejected. Another test is the addition of a few drops of a one to one thousand solution of permanganate of potassium to a glass of water and the pink tint produced should not disappear. The fact of the presence of an excess of chlorides in sewerage contaminated water is also made use of to determine its purity. This excess may be determined by the degree of white cloudiness or actual precipitate produced in the water on the addition of silver nitrate solution. A recently discovered color test for nitrites is recommended for its simplicity and accuracy. Messrs J. F. Schwarzlose Soehne, in Berlin, furnish a solution of sodium anilin-p-sulphonate containing hydrochloric acid and tablets of anidonaphtholdisulphonic acid. To make the test add one teaspoonful of the solution to a quarter of a tumberful of the water to be tested and ten minutes later a tablet. After standing for one hour if the tested specimen is light pink it shows a water that is not good, but which may be employed in case of necessity. If a rose-pink it shows a water unfit for drinking, and if a magenta it shows a water extremely dangerous to health.

Of the numerous methods of water purification it would seem that the most practical and effective for soldiers is boiling. Where properly distilled water can be procured it should be given the preference. Where this cannot be procured the harmful organic matter may be rendered harmless by boiling. The Waterhouse-Forbes sterilizer now in use in the army would seem to be the best practical appliance for sterilizing water. I have had no personal experience with it.

The advantages claimed for the sterilizer are efficiency, inexpensiveness in operation and portability. The water issuing from the sterilizer is said to be only $4\frac{1}{2}^{\circ}$ F. hotter than that entering it. A few points concerning sterilization of

water should be borne in mind. If heat is the method employed the water should actually be brought to a boil, not merely warmed. If water is boiled for any length of time its contained gases are driven off and the water left with the well known flat taste. This may be remedied by allowing the water to fall through holes in the bottom of a coal oil can and thus aerating the water. Boiled water does not remain sterile and unless flies and dust are excluded it may become more contaminated than it was before sterilization. Frequent dipping into water, especially when the dipper is used to drink from, is a common method of pollution of stored water. Sterilized water must be as cool, palatable and as easily procured as the natural water, otherwise instructions and orders concerning the exclusive use of sterile water will prove unavailing. Contaminated water is not sterilized by the addition of alcohol in any form or quantity.

(F) *Shelter and Disposal of Wastes:*

The shelter for our troops in the tropics has so far been mostly native buildings, previously constructed for various purposes. Palaces, theaters, churches, monasteries, barracks, hospitals, colleges, mills, private residences, hovels and stables have all given shelter for days, weeks and months, to troops to which I have been attached, and this shelter, imperfect, inadequate and positively unsanitary as it often was, is better than any tentage that could be supplied. If tents must be used the Munson Hospital Tent with ridge ventilation, dark colored walls, and overhanging fly, is the best type with which I am familiar. Tents, should, if possible, be pitched in the shade on platforms raised from the ground. One danger in the occupancy of native dwellings by troops is the possibility of infection with the germs of contagious diseases. The construction of these houses renders their disinfection by means short of destruction by fire, impossible. I know personally of natives with smallpox having been expelled from houses in which our troops immediately took up their abode, and I have good reason to believe that cases of leprosy previously occupied some of these same houses in

which we lived for two days. I have furthermore seen a record showing that our troops occupied yellow fever buildings—buildings infected by the presence of cases of the disease—in Cuba.

Occupancy of previously occupied native dwellings, then, must be accomplished with due regard to this danger of infection.

For temporary use, barracks of native design and material are easily and rapidly constructed with little cost and are fairly comfortable and sanitary. I have in mind the Filipino barracks at Tarlac which were in process of construction when the capital was occupied by our troops. The uprights, one end of which were buried in the ground, were of wood, and the remainder of the framework of bamboo. The shed and walls were of nipa. Along the walls, on the interior, raised some four feet from the ground was a bamboo platform about ten feet wide. This served as beds. The structure was roomy and the shed high. An adjoining shed served as cook house. Board structures may be used for temporary occupancy. The essentials are: floors must be as far as practicable from the ground, roofs must be high; air space must be ample—one thousand cubic feet per man is insufficient in the tropics and it is to be remembered that in computing air space, space above ten feet from the floor must be disregarded.

Ventilation should be ample and the native custom of having large and numerous windows, should be observed. For the prevention of malarial fevers, one of the greatest scourges of the tropics, it is essential that barracks be mosquito proof. To accomplish this permanent frames of netting must be placed in the windows and all other ventilators and the screen doors should be double like storm doors, so that one door closes automatically before the other is opened. The same protective netting should prevent the entrance of flies and mosquitoes to mess halls and kitchens. No camp or garrison in or out of the tropics, with flies in kitchen or mess halls should be considered in a sanitary condition.

As to permanent barracks I can best quote verbatim from "The Hygiene of the Soldier in the Tropics."⁹ Barracks should never be built hastily, as a simple shelter from the sun and a roof to keep off the rain; they should be, in every sense, a protecting, hygienic, and healthful lodging.

"The colonial habitation should be built with the greatest care, and of material possessing sufficient resistance to withstand damage, as by the sun, rain, winds, meteors, humid or paludal soil, or the action of insects; if it suffers from these causes, the occupant would suffer more."

"This is a principle too much ignored by builders who rely on the mildness of the climate and imagine that a simple screen interposed between the resident and the exterior suffices to protect him, without taking account of the danger from the proximity of a paludal soil.

"Constructed upon dry ground, or ground dried by fire and carefully rammed, the barracks should be raised upon arches, or even upon piles, whenever it is too difficult to obtain perfect drainage. Cisterns, reservoirs, pumps—anything in a word, which can hold moisture—should never be placed in barracks. Humidity, indeed, is the condition most favorable to the development of germs.

"The walls should be very thick. The ideal building in a tropical country would be of granite or of cemented marble, and the conquering Spaniards divined the best means of having cool houses in their lavish use of hard stone and marble in their sumptuous palaces in Havana.

"The walls should be painted, not white, but in light colors. It would be best to use oil paints, which vitrify the surfaces, facilitating cleaning and disinfection. The stairs should be iron, and wide passages should separate the apartments on each floor.

"The flooring of the ground floor should be well raised, a meter at least, especially if there are no cellars.

"The roofing should be double or doubled with a ceiling, and sufficiently inclined. In the colonies shingles, thatch, zinc, and brick are used. The most commendable roofing is

certainly one of fitted bricks resting on imbricated and strongly fastened shingles. Terraced roofs would have more inconveniences than advantages.

"A gallery is indispensable for each story. One sleeps inside the house, but one eats, receives, works—in fact, lives on the gallery. The flooring of the ground floor should be continued under the gallery, and the materials, glazed or ceramic tiles should be the same. It projects beyond the walls three to four meters and is supported by columns of brick, stone, or cast iron. The interior wall should be that of the house itself, painted gray or light yellow; the external walls should be made of fixed or movable Venetian blinds, or even of matting blinds. It is well to have the gallery run all the way around the house; one of the sides will then always be shady.

"All the windows should be *portes-fenêtres*, since all open upon the gallery. These large openings from floor to ceiling facilitate the renewal of the interior air. The outside shutters should have overlapping slats capable of being opened to admit the light; the interior doors should be glazed and ought to be closed at night. The rooms should be very large; the local accessories of the barracks should be on the ground floor."

These barracks should be mosquito proof. The water-closets should be of the latest automatic flush pattern and the floors and walls should be constructed of marble, stone or tiling and built with as much care as a modern surgical amphitheatre. Kitchen refuse should be kept in tightly covered metal receptacles, surrounded by a framework of netting, until finally disposed of. Flies should be absolutely excluded from this garbage. In temporary camps with no sewerage system sinks dug in the earth or the cylindrical, metal, trough, closet issued by the quartermasters' department must be used. If sinks are to be used the surface water must be at least five feet below the surface so that sinks four feet deep will at all times be dry. Proper sheds and shelter must protect the sinks from sun and rain. If sinks are used each man must

cover his dejecta as soon as passed, with dry earth. Some one must be responsible for the proper performance of this most important duty. One noncommissioned officer should be regularly detailed to each sink, the sink should be frequently inspected by company officers and once daily by a surgeon who should report to the commanding officer whenever any uncovered excreta are found. I cannot emphasize this point too strongly. Any other method of dealing with excreta in a sink renders that sink a menace to the health of the command. Disinfectants may be added to the sink and a covering of sand thrown in three or more times each day, but to render a sink a sanitary institution each man must thoroughly cover his dejecta as soon as passed. This is done in the German army, and has been done in our army as is instanced in many official reports. As far as my experience goes, it would seem that what is needed to make this practice effective is the hearty co-operation of the company officers with the medical officers. It has been my misfortune to see this method fail when division and regimental orders left nothing to be desired, and on account of the perfunctory enforcement of the order by company officers. If the company officers do not fully appreciate the necessity of keeping excrement out of the food, it will not be kept out.

Flies carry particles of dejecta and disease germs from dejecta to the food and also directly to the hands and mouths of men.

If sinks are impracticable on account of the high level of surface water some system of dry earth closet must be used, and the system, whatever it is, is valueless and fraught with danger if at any time flies come in contact with dejecta. Cavalry and light artillery officers have another problem: the disposal of horse manure which attracts flies in large numbers, but which, fortunately, is not in itself, such a menace to health as human excrement, owing to the comparatively few diseases transmissible from horse to man. Where it is practicable crematories should be established for consumption of organic wastes and in them, the germs of disease.

This matter of proper disposal of wastes is no trivial one and requires much perseverance, tact, and judgment, on the part of all concerned.

(G) *Work, Recreation, Habits, Etc.*

Can as much work be done in the tropics as in the temperate zones?

The amount of work capable of being performed by the human machine has been determined with precision, and may be divided into internal work, or work required for the performance of the bodily functions, and external work. This internal work varies greatly and has been estimated at about 260 foot tons. An average day's work (external work) is about 300 foot tons. Referring to a table of Haughton's in Notter and Firth's *Hygiene*¹⁰ (page 421), it is seen that an Indian dhooli bearer does 600 foot tons of work daily and an Indian hill coolie 500 foot tons. From these figures it would appear that the external work of tropical laborers is not less than that of laborers of temperate climates. Troops composed of natives of the tropics, then, might be expected to perform as much work in the tropics as troops in the temperate zones.

In practice it will be found that the average of work performed by our troops in the tropics is decidedly less than the average of work performed at home, and that this is of necessity the case. Although for a time the American soldier in the tropics is able to perform his usual amount of work, interference with internal work by extreme heat, or its effects, or actual disease caused by germs, will sooner or later decrease his capability for external work. It would seem useless to dwell longer on a matter of common knowledge and observation, but other phases of the question may be dwelt on with advantage. The character of the work should be confined to strictly military duties and native laborers should be freely utilized as scavengers, for policing, for handling supplies, and, in campaign, for digging trenches, throwing up earthworks, for carrying blanket rolls, knapsacks, and even extra ammunition where wheel transportation is impracticable. It has

been demonstrated that, with proper handling, natives make excellent litter bearers, and can relieve the hospital corps of menial duties in field hospitals, thus allowing these sanitary soldiers to minister more effectually to the needs of the sick and wounded.

In garrison, drills and ceremonies should be conducted in the early morning, and should be interspersed with frequent rests and changes.

The laws of Fatigue and Refreshment, always of importance in exercise and physical training, are most carefully to be regarded in the work of the tropical soldier. The law of fatigue may be stated as follows: ¹¹“When the same muscle (or group of muscles) is kept in constant action until fatigue sets in, the total work done, multiplied by the rate of work, is constant.

“The law of refreshment depends on the rate at which arterial blood is supplied to the muscles, and the coefficient of refreshment is the work restored to the muscles in foot pounds per ounce of muscle per second. For voluntary muscle it is .1309 and for the heart .2376, or exactly equal to the work of the heart, which never tires.”

In campaign, although the hours of work can not always be selected, still much may be done towards conserving the health of the men by the use of native bearers and coolies.

While overfatigue should carefully be avoided a proper amount of exercise is essential for the avoidance of ennui and the preservation of health. One hundred fifty-foot tons is considered the minimum amount for this purpose and is equal to a walk of about nine miles. In this amount the exercise taken walking around in quarters, etc., must be considered and if marches are taken with arms and accoutrements the weights carried must be considered. The nature of the ground whether level and hard or otherwise must also be considered.

The time of the men should be fully occupied. Up to date schools should be conducted and libraries and games for amusement furnished. The customary siesta should be observed in so far at least as to allow the soldier to rest two or

more hours in the middle of the day in any way he sees fit. The schools should be made of interest in every way possible. Besides instruction in the primary branches lectures on the university extension plan might well be given. The history and geography of the country could be studied to advantage. Sanitary matters having special application to the conditions under which the troops are living could be discussed with advantage to all concerned. A voluntary library could readily be raised and the civil aid societies would gladly contribute to such a purpose if the matter were properly brought before them.

To have an efficient tropical army temperate habits are a necessity. From a consideration of the many opinions and theories concerning the necessity of taking some form of alcohol in the tropics, opinions and theories advanced by those in no way competent to form an opinion or advance a theory on this or any other medical subject, as well as by those competent to speak on the subject, from my knowledge of life in the tropics and of the effect of alcohol on the human economy, I have no hesitancy in stating as my opinion that alcohol is no more necessary in the tropics than it is here. Further I believe it is conceded that over indulgence in alcohol is peculiarly dangerous in the tropics, as this or any other practice that lowers the vitality of the body renders it an easy prey to disease. In speaking of yellow fever Wolfred Nelson in the *Twentieth Century Practice* says: ¹² "The moderate drinker, as a rule, is lost from the start. * * * The use of alcohol in any form by newcomers within the tropics is a very pernicious habit. * * * If one must live in the tropics, or try to live there, let total abstinence be made a rule of life."

If alcohol is used at all in the tropics, strict temperance must be observed in its use.

The hours of sleep must not be abridged, as the resisting power of the organism is thereby reduced.

In localities where venereal disease abounds, periodical medical inspection of the men is advisable.

Finally, cases of sickness should receive prompt attention and a periodical inspection of the feet, such as is required in the German army, should be made.

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THE PHYSICAL DEVELOPMENT OF THE RECRUIT.

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THE physical development of the recruit is of interest to all army officers because all desire to have in their commands men of fine appearance and muscular power. But to us as military surgeons it is especially so because we recognize its importance as a factor in preventing disease. Nevertheless no attempt has been made in our Army to utilize in practice this branch of military hygiene.

It is strange that in the United States where so much has been done to increase the efficiency of the Army by the enforcement of prophylactic measures against disease, so little attention has been paid to the physical development of the soldier as a measure to increase the resisting powers of the system against the exposures incidental to military life.

In this respect we must admit being years behind almost every European power. Austria and Germany recognized the value of physically trained soldiers as far back as 1842. Russia after her experience in the Crimean war lost no time in establishing schools for the training of her soldiers as did France after her disastrous encounters with the military athletes of Germany. England, Norway and Sweden all have compulsory physical training in their armies and no one can gainsay the splendid results accruing therefrom.

It is to be regretted that a compulsory system of physical exercise is not in use in the United States Army. Heretofore we have not felt the need of it; our Army has been small and the varied duties of the men kept them employed giving them plenty of exercise but not exercise of a character calculated to do the most good. The hardships and exposures of actual

campaigning in which there was required just that reserve power which is given by properly conducted physical drill were not known, and it is only now when the majority of our troops are actively engaged in such work that we realize the value which a thorough course of military physical drill would have been to them.

The physical drill for our recruits and soldiers as practiced in the Army at the present time is wrong because unsystematic. Physical exercise of all kinds is encouraged but no drill is ordered. The provision for drill is left to the commanding officer of the garrison who may or may not order exercise of this kind as he sees fit.

For this reason probably little benefit has been derived from what has been done. In many instances drill call is sounded too soon after breakfast and were it not for the perfunctory manner in which the work of the drill hour is carried out it would result in harm rather than benefit.

Generally the exercise to which the recruit is subjected in his drill in the "Manual of Arms" is regarded as all that is necessary for his military development. But drill with the rifle while it gives exercise develops the muscles of only one side of the body and does so at the expense of the other side if continued any length of time. Besides this drill after a while becomes more or less automatic exercising the muscles without interesting the brain.

The exercises usually adopted to supplement the deficiencies of military drill are taken from "Butt's Calisthenics" and are in themselves excellent and all that could be desired for the development of the recruit; but they are selected in a haphazard manner by the drill master usually a non-commissioned officer who has no idea of the results to be obtained from their use.

New recruits are made to fall in and use the same exercises as those who are more advanced. Exercises of a severe character that should be used only after the muscular system of the recruit has become used to them being given for the same length of time and alternately with those of the simp-

lest character. Unnecessary and harmful exercises are given to recruits: such are those tending to increase the muscular development of parts already abnormally developed from their previous occupations. The dangers of too long or too severe exercising is not appreciated by the uninstructed drill master nor is he qualified to alternate the exercises so as to obtain the desired results. In fact the extent of the knowledge of drilling recruits possessed by most non-commissioned officers is limited to the giving of commands as prescribed in some drill manual.

It can readily be seen that under such conditions the chance of obtaining good or bad results are about equal.

Our knowledge of hygiene points out to us that this system is radically wrong. Physical drill if properly supervised will bring the system of the recruit into that condition upon which depends military efficiency. This physical training is of double value as it not only gives to the soldier the strength of constitution which enables him to sustain the hardships of campaigning without which he will eventually break down, but it also gives to the service men physically trained both in mind and body, bright, active and with physical strength and endurance, qualities necessary to an efficient military command.

In the physical examination of the recruit many defects in his physique may be detected; these may not be so serious as to disqualify him for military service but it must be remembered that as a chain is no stronger than its weakest link so the recruit is no stronger than his weakest part be it his heart, lungs or legs. Hence, the physical drill or exercise in the case of each recruit should be directed first to strengthening his weakest part and incidentally in doing this the whole system is benefitted.

Military athleticism should have in mind three factors: activity, strength and endurance, these three qualities being essential to the soldier. With a sound constitution as a basis these may all be obtained by physical exercise properly conducted. But, as before stated, each recruit has some partic-

ular defect to be remedied and all may not be benefitted by the same character of exercise. Judgment must therefore be shown in the selection of exercises and this can only be done by having, not only a knowledge of the exercises, but, also of the muscles engaged in performing the movements. Also, the instructor should have some knowledge of the physiology of the heart, lungs and circulation that he may not over tax the strength of a recruit not so well able to sustain the strain as others. The exercises should be graded so as to be always well within the powers of the weakest in the class.

Before we can look for improvement in the general development of the recruit in our Army two things should be done. First, physical exercise should be made compulsory and a certain amount of time set aside each day for that exercise. The possibility of having it done should be taken out of the hands of Post Commanders who should by orders from superior authority be required to see it carried into effect. Second, the instructors should be men who have themselves been instructed specially in this branch of military science.

In order that this may be accomplished a certain number of non-commissioned officers from each regiment should be sent each year to one of our large posts (preferably one used as a recruiting depot, where during the latter part of their course they could have materials with which to work) and under the supervision of a medical officer be instructed in this branch of military training.

This course should be extended over from four to six months during which time the men should be given an elementary course in Anatomy, making them familiar with the actions of the heart, lungs and all the muscles in so far as these are related to exercise. In physiology they should be shown in a popular or non-technical way how exercise conduces to metabolic changes in the tissues, together with the effects of faulty training, over training and lack of training.

They should be instructed how to take measurements and how to record the gain made during his course of instruction by any recruit. Then having a good idea of the muscles and

their actions they should be taught exercises tending to counteract the minor defects found in recruits. Those tending to give agility and suppleness being first taught and subsequently those which are of a strength giving character. They should be impressed with the dangers consequent upon improper drill and should be taught to instruct the recruit, making their exercises as much a recreation as a military duty, for in this way only will the best results be obtained.

When, through this schooling we are able to get a good corps of drill masters, who are not only capable but earnest in the performance of their duty, we may then anticipate good results from our system of physical training.



EFFECTS OF OVERWORK, ESPECIALLY AS APPLIED TO TROOPS.*

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IT HAS been stated, by one of the successful generals in the late war with Spain, that "The proper time of rest and the safe amount of marching are as much a part of the soldier's duty and training as is personal courage, discipline and tactical skill on the field of battle."

There are four duties which are of much importance in a soldier's life, from which the effects of overwork will plainly show itself: (1) marching to a desired destination; (2) on the firing line in battle; (3) on guard duty; (4) drilling on the field.

1. *Marching to a Desired Destination.*—It often becomes necessary, sometimes absolutely so, for troops to make long and rapid marches to reach the field of battle in season to be of use; but if such troops are brought on the battle line exhausted and overtired, and, as a consequence, less courageous than under different circumstances, they would necessarily be more detrimental than a benefit to the cause they were to fight for. Although the troops had marched a great distance and made remarkable time in order to reach the point desired, they would be compelled to take an obscure and unimportant position, such as the rear line, or perhaps far away in the reserve, while well equipped in all other respects, on account of being overworked, and, in consequence of this, lacking strength and physical force necessary to battle courageously and successfully. It is a conceded point among all military men who have had experience on the battlefield, that men, to be cour-

*Read before the School for Medical Officers of the Massachusetts Volunteer Militia.

ageous, persistent and successful in battle, must reach the field in as fresh and healthful condition as possible, mentally and physically.

It is a difficult problem to solve, and no set of rules can be formed for a guidance,—that the troops can march just such a distance, and just so fast each day, and not be overworked. Among military men, opinions differ very much. One of the successful brigade surgeons of the late war, and of much experience in the civil war, has said that any body of troops should be able to walk twenty miles or ride forty miles each day, and keep it up for some time. Another officer of much experience has said that his command had often marched twelve miles a day and quite a number of times marched thirty-two miles in a day. On making inquiry more particularly into the matter of the thirty-two miles per day, he said if a halt was made most of the men would drop to the ground at once, and be sound asleep in less than a minute, and when the time came for them to move, it would be almost impossible to arouse them; and generally after such a long march it would be at least a week, if not longer, before the men would recover from such a strain. Another officer, quite as experienced, has said that troops should not march much if any over five miles per day previous to battle, as that is all that is possible to do and not be overworked.

Therefore, one of the effects of marching to the point of overwork is that troops are less able to go into battle and fight as soldiers are expected to fight; and, unless having all the energy and vitality they possess at hand, battles may be lost which only for this detriment should be gained.

2. *On the Firing Line in Battle.*—One of the effects of overwork of men on this duty is loss of nervous vitality and nervous energy to a point of either temporary insanity or collapse; and one of the greatest causes of this deplorable state at this critical time is the lack of protection of some kind during the battle. If, however, they are protected, even if but slightly, by a clump of trees, trenches, or rifle pits, it is possible for the men to stay on the firing line a long time and

not become overworked or exhausted. More especially is this marked where refreshments of some kind, even of the simplest in quality are furnished.

3. *On Guard Duty.*—It may seem a strange thing to believe that men can be overworked and exhausted while on guard duty; but it is nevertheless a fact, corroborated by officers and men in both the civil war of 1861 and the last war of Cuba and the Philippines. If a man is on outpost or picket duty in a strange country, where the enemy are active and treacherous, it is very necessary to relieve the guards often, or they become very much overworked and exhausted. It is not altogether the loss of sleep at night, but it is the overstraining of the nerves, in keeping up the constant watch and expectancy, that wears upon the vitality of the guard. After performing such duty, it is necessary that the guard be relieved from duty of any kind from eight to ten hours at least, in order to recuperate, or he is soon relegated to the hospital, unfit for any duty. Only as late as April, 1900, General Young in northern Luzon made several requests that he be reinforced, as the men were becoming exhausted by the necessity of constant vigilance.

4. *Drilling on the Field.*—This is a question on which many different opinions might be gathered as to the proper amount of drilling troops should have each day, and not become overworked. It is quite possible to drill men that have but recently enlisted in the army, and that are not habituated to the mode of living in the field or camp, to a point of exhaustion; but if men are used to the work, and have performed it for some time, it is hardly probable that they can be overworked. The object in view is to get the men to work industriously and diligently as many hours in the day as possible without becoming overworked. In order that the troops may be able to do a sufficient amount of drilling, it is necessary that each man be thoroughly interested in the work. An officer who keeps the men interested all the the time is successful, and is able to keep his men hard at work and for quite long periods without any detrimental consequences; every order

is obeyed promptly, sharply and exactly as given, and the entire command is proud and pleased to learn something; and time passes so rapidly that before the men realize it they have done a long and hard day's work, and not become overworked in the least degree. On the other hand, an officer who is unable to make his men feel interested in their work is sure to come into camp from drill with his men tired, exhausted and discouraged; and during the time of drill every command that is given seems to be obeyed with an exertion and reluctance, and the men seem to be hardly conscious of what they are doing; time drags heavily, and they wish it would soon end, that they might be relieved. After such work as described, the command is not fit for anything but absolute rest.

I might quote many officers whose assertions would coincide with mine in every particular, and who state that it is easy to account for the failure of troops sometimes where they should succeed; viz., that by the lack of constant care and forethought the troops are many times overworked, and therefore fail to do the expected.

WHAT IS THE NATURE OF THE PORTO RICAN “ANAEMIA?”

By HERBERT M. McCONATHY. M. D.

CONTRACT SURGEON IN THE UNITED STATES ARMY.

DURING the years of 1899 and 1900 the attention of the U. S. Army surgeons who were then serving in Porto Rico was called to a disease which is quite common among the inhabitants of that island, and which is known there simply as “anaemia.” This disease is interesting first, on account of its high mortality,—there are practically no recoveries; and secondly, on account of its prevalence. On this latter point no statistics are obtainable, the Spanish official figures being, in my opinion, absolutely worthless. However, I asked several resident Spanish physicians for an estimate as to its prevalence, and was astonished to find that at least fifty per cent of the total number of deaths are attributed to this disease alone.

Opinions as to the cause of this trouble are various. Insufficient nourishment is, naturally, the usual reason assigned, because the poorer people live on plantains almost exclusively. There are some who think rheumatism an important factor on account of the pains in the limbs during the earlier stages and the frequent involvement of the heart which follows. The only real study of the disease of which I have heard was that made by Lieut. Bailey K. Ashford, Assistant Surgeon, U. S. Army who was at that time in charge of the hospital at Ponce. Dr. Ashford pronounced the disease ankylostomiasis.

From about the first of September, 1899 to about the first of August 1900 I was stationed in Adjuntas, a small town in the interior where this disease is especially common, and during these eleven months I saw hundreds of cases. As my post

was small I could not secure a microscope, but I made many autopsies.

In all of these cases I found a few very constant symptoms. During the first stages most patients complained of pains in the limbs, sometimes quite severe, but hard to locate definitely. Tenderness on deep pressure of the limbs was generally elicited during the examination although partial anaesthesia of the skin was frequently noted. In many cases the gait appeared more or less ataxic. Dilatation of the heart was always found, and during the later stages this was usually accompanied by a general anasarca; a swelling of the feet being one of the earliest symptoms. This dilatation of the heart is not, as a rule, accompanied by any valvular disease or other signs of endocarditis, though a relative valvular insufficiency, owing to the dilated rings is very early and constantly noted, and gives, of course, a strong systolic murmur.

It will be seen from the above that my study of the disease was very incomplete, I had no idea at the time that I was meeting anything particularly new or strange; moreover, none of the soldiers were affected. But even from this incomplete study there were shown to be some objections to all the theories as to the cause of this malady. Insufficient and improper food is, without doubt, the main predisposing cause; in fact it is hard to understand how a human being can sustain life on the diet on which a majority of the Porto Ricans subsist, especially those who live in the mountain. But starvation can not be the only cause of this so-called "anaemia" for cases are occasionally met with in persons who are well-fed. The rheumatism theory can be dropped on account of the absence of definite joint symptoms and of endo- or pericarditis. As to ankylostomiasis, I can readily credit the statement that it is wide-spread in Porto Rico and productive of much harm, but this diagnosis will not account for the partial anaesthesia, the rheumatic pains and the tenderness of the muscles on deep pressure. The dilatation of the heart I found to be such an early and constant symptom that it is hard for me to believe it merely a result of the anaemia.

Since coming to the Philippines I have seen a disease which reminds me very forcibly of the Porto Rican one; it is beri-beri. The more I see of beri-beri the more striking the the resemblance seems. I regret that I did not test the knee-jerk in the Porto Rican "anaemia" for the absence of this reflex is an important point in the diagnosis of beri-beri, and this is the only thing lacking to establish in my opinion, the identity of the two diseases. It would not surprise me if it were found upon investigation that beri-beri and ankylostomiasis were combined in many of these cases of Porto Rican "anaemia." At any rate, I am firmly convinced that in a large proportion of these cases we have to deal with a specific disease and not with merely the results of starvation.

Apart from the scientific interest of this question, it is one of vital importance to the island, for if this anaemia prove to be a specific disease the physicians as well as the laity of the island should be instructed as to its prevention and cure, for under the present system of treatment the mortality as mentioned above, is practically one hundred per cent.

Moreover, this disease is generally chronic in its course, and its victims exist in a state of invalidism or semi-invalidism for months before they finally succumb. This fact, combined with the exceeding prevalence of the malady greatly impairs the working power of the population and interferes most seriously with the progress of the island.

I would be very glad to hear an expression of opinion on this subject by those surgeons who have served in Porto Rico and who have also come in contact with undoubted cases of beri-beri.

DUTIES OF THE MEDICAL DEPARTMENT AT "GENERAL QUARTERS."

By DUDLEY NEWCOMB CARPENTER, M. D.,

PASSED ASSISTANT SURGEON IN THE UNITED STATES NAVY.

THE ALARM has sounded and the ship is being "cleared for action." The Surgeon's division, consisting of the Assistant Surgeon, Hospital Steward and Hospital Apprentices, aided by as many convalescent patients as may be available, will equip the selected "Dressing Station," which on this battleship is the warrant-officer's mess-room, on the berth deck, within the casemate. The mess table will be unfastened and placed in one corner of the room, and on it will be arranged the various dressings, stimulants, sterilizer, etc. The Siegfried portable operating-table is removed from its case and occupies the space where the mess table was. A large "cargo-light" is swung above this table for extra light. Irrigating solutions of bichloride and boracic acid fill the large bottles in the portable-rack attached to the forward bulkhead. Instrument-pans and basins with antiseptic solutions are placed on the transom.

The following equipment of this dressing-station will be provided :

- | | |
|---------------------------------|-----------------------------------|
| 1. <i>Anaesthetics,</i> | Green soap, |
| Chloroform, } | Alcohol, |
| Ether, } with inhaler, | Ether, |
| Cocaine, } with hypodermic | Bichloride sol. 1-2000, |
| Morphine, } needle. | Sterile distilled water. |
| Rhigolene. | |
| 2. <i>Aseptic preparatives.</i> | 3. <i>Table,</i> |
| Razor, | Rubber sheet and pillow-case, |
| Nail brushes, | Blankets, |
| Basins | Tub beneath to receive solutions, |

- | | |
|---|--|
| <p>4. <i>Haemostatic and Operative</i>,
 Case of Haemostats,
 General Operating case,
 Instantaneous tourniquets,
 Esmarch's Bandage,
 Needles, (assorted),
 Ligatures, (catgut and silk),
 Sutures,
 Sterilized gauze abdominal pads,
 " " sponges and strips,
 " " towels and sheets.</p> <p>5. <i>Dressings</i>,
 Sterile Gauze, { Bichloride,
 { Iodoform,
 Cotton (Borated),</p> | <p>Bandages, { Muslin, Gauze,
 { and Plaster,
 Slings,
 Pins and Safety Pins.
 Collodion,
 Splints (wire and wood).</p> <p>6. <i>Restoratives</i>.
 Whiskey,
 Brandy,
 Strychnine and Digitalin (tablets),
 Blankets,
 Hot water bottle,
 Electric Battery,
 Normal salt solution.</p> |
|---|--|

The "Ames Boards*" are placed on the decks and "first aid" packages are distributed by the hospital apprentices to the officers and crew of each division. Instruction in first aid and the use of the board is part of the regular drill in times of peace. At the foot of the ladders, on the deck where the dressing-station is situated, are "aids-to-the-injured" taken from the convalescent patients or "idlers" especially detailed for this duty. These aids are directed to receive wounded as they come below on the boards and to carry them to the place the Hospital Steward designates. They then return the boards to the deck from which they came. The Hospital Steward decides which cases need immediate attention and sends them to the operating room. The cases which can wait he makes comfortable by mattresses and blankets, hypodermic injections of morphia, or stimulants when necessary. Any cases that have not had their first-aid dressing applied he attends to, and inspects those who have had to see that the dressings have not slipped. On this battleship† the entire berth deck within the casemate, including chief petty officers' mess room, engineers' log-room, passage-ways, and officers' staterooms, would be utilized as a hospital and could

*These were inadvertently styled "Mahan Boards" in the author's paper on page 432 of the present volume. They were designed and first employed by Surgeon H. E. Ames, U.S.N. in 1893.

†The U. S. S. "Illinois."

readily accommodate 150 wounded. Both surgeons and hospital apprentices will be in the dressing-station.

When battleships are constructed with a sick-bay outside the casemate it would be advisable to fit a convenient room within so that it could be used in action as an operating-room. With very little trouble a similar room to this one could be fitted with rack for irrigators and with folding wall-tables to hold dressings and instruments without interfering with its value as a mess-room. To be readily cleansed the floor might be of small marble-tile in cement (*Mischiati*). A large door would facilitate the handling of the patient.

During action there is generally an "engaged" and "disengaged" side of the ship. When a man is wounded on the engaged side then, men from the disengaged side will be available to render aid and send him below. This brings up the question if the wounded should be moved at all during action. Sufficient experience with modern ships has not accumulated to answer this question definitely, and many reasons can be given for and against such removal. On a Japanese cruiser, during the Chinese-Japanese war, and again on the flagship "*Reina Christina*," during the battle of Manila Bay, the wounded, collected at such a dressing-station, were destroyed by the penetration and the explosion of a shell. On a battleship they would be better protected below. Besides, their presence near the guns might tend to shake the nerves of the crew, and also expose a wounded man to additional injury. Therefore it seems more advisable to send them to the dressing-station in the first place. On a protected or unprotected cruiser the same reasons hold good, for the dressing-station is certainly as safe as any other part of the ship, and the surgeon would have every means at hand there to properly treat the wounded. One objection, the rapidity of removal from the deck, is answered by the Ames Board, and its simplicity and inexpensiveness should permit as many as are necessary, to be had.

If there should not be time to apply the first aid dressing on deck the wounded man can be fastened to a board and sent

below. Arterial hemorrhage must be stopped, however, by means of the sailor's kerchief used as a tourniquet. Should a man not be rendered helpless by his wound he may be able to walk to the dressing-station. Wounded men in the fighting-tops should be sent below on the board by means of the ammunition whips. On the super-structure and bridge-decks the boards from the upper decks may be used. Injured men or those overcome by the heat of the fire room, can be sent up on the boards through air-locks, or by any direct hoist. In the turrets of battleships the wounded may be easily removed from the lower platform.

The operative measures adopted during action will be entirely for the relief of arterial and venous hemorrhage, by ligation or by packing. Every wound will carefully be rendered aseptic, the ragged edges trimmed and sterile dressings applied. Extended operations on individual cases will probably not be attempted until after the engagement is over.

THE SURGEON GENERAL OF THE GERMAN ARMY.

SURGEON GENERAL Rudolf Ferdinand von Leuthold, First Physician-in-Ordinary to the German Emperor, has been appointed Surgeon General of the German Army in succession to the late Surgeon General von Coler. Surgeon General von Leuthold was a student at the Frederick Wilhelm Institute, and received his professional education at the University of Berlin. After passing the State examination in 1857, he became an Assistant Surgeon in the Army, was promoted to the grade of Staff Surgeon Major of the second class in 1867, Staff Surgeon Major of the first class in 1875, and Surgeon General in 1889. He was associated with the late Professor von Lauer in the medical care of the Emperor William I., and on the accession of the present Emperor was chosen by him to be his Physician-in-Ordinary. Surgeon General von Leuthold was for many years professor of military surgery in the Kaiser Wilhelm Academie, and up to his promotion was also one of the editors of the *Deutsche militärärztliche Zeitschrift*, the German medico-military journal.

THE ADAPTATION OF ACETYLENE ILLUMINATION TO MOBILE FIELD HOSPITALS.

By CAPTAIN EDWARD L. MUNSON, A.M., M.D.

ASSISTANT SURGEON IN THE UNITED STATES ARMY; SURGEON
GENERAL'S OFFICE.

SOME three years ago the writer became interested in the possibilities of acetylene illumination for barracks and post hospitals, and conducted a number of tests in connection with an acetylene plant installed for trial at the Company of Instruction, Hospital Corps, U. S. Army General Hospital, Washington Barracks, D. C. The results obtained were so favorable to the use of acetylene gas as a desirable means of illumination when electricity or city gas could not be obtained, that the investigation was continued with a view of determining the practicability of acetylene for the illumination of tent or other temporary hospitals, having particular reference to the facilitating of field surgery. Throughout this work the writer received the utmost assistance from the J. B. Colt Company, makers of acetylene generators, 21 Barclay street, New York, who spared neither expense nor trouble in the effort to perfect an illuminating outfit which would best meet all the conditions of field hospital service.

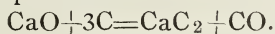
The ideal outfit for field hospitals should be portable, light, compact, simple in construction, not liable to get out of order, easy to put up and take down and to pack and unpack. It should be automatic in operation, and the latter should be such as to be easily understood and regulated by the dullest soldier. It should give a light of any desired intensity in any part of the hospital, and should maintain this illumination for a reasonable period without the necessity of recharging. The generating apparatus should be economical in its use of carbide, and be free from any liability to accident and explosion. Clearly,

it was not a simple matter to combine these various essentials in a single outfit.

Several experimental outfits were made which proved more or less defective; and later improved outfits were sent to the U. S. Army Field Hospital at the Pan-American Exposition, the tents of which were illuminated by them during nearly all the exposition period. As a result of this extended practical trial, certain minor defects which were still found were corrected,—and the field hospital outfits described in this paper undoubtedly represent much the most complete and practicable equipment for medico-military use yet devised. Of this fact, the Board of Revision of the Supply Table, lately in session, was apparently satisfied, as the new outfits have been promptly adopted as part of the U. S. Army field hospital equipment. They had also been previously adopted by the Canadian military service, and several outfits have been sent to South Africa with the field hospitals accompanying the Canadian contingent.

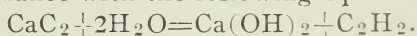
Inasmuch as acetylene lighting has been brought into practical use only within a few years, and as many are hence not familiar with the physical and chemical properties of this gas, its method of production and illuminating powers, a brief preliminary consideration of these points may be of advantage before entering upon a description of the field illuminating outfits.

Acetylene gas is made from calcium carbide, which is produced by fusing together ground quick-lime and coke in the electric furnace, at a temperature of 4500 degrees F. The change which takes place is:



Calcium carbide is a hard, dry, solid, opaque, crystalline substance, of a dark brown or black color. Its chemical formula is CaC_2 . It is incombustible in the atmosphere, will bear heating to redness without change, bears transportation admirably and may be preserved indefinitely if protected from air. Like lime, it is affected by the moisture present in the atmosphere; and combines with it to form slaked lime, acety-

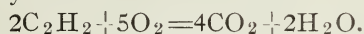
lene being given off during this combination. The addition of water causes this change to occur very much more rapidly, and in accordance with the following equation:



It is thus seen that beside the acetylene gas, C_2H_2 , a by-product is milk of lime, $\text{Ca}(\text{OH})_2$, which is of maximum causticity and is excellent for purposes of disinfection. As the milk of lime is made direct from calcium carbide, there is no opportunity for loss of causticity as a result of exposure to the carbon dioxide of the air, as occurs with ordinary quick-lime after burning, and the resultant is always an efficient germicide. Even the secondary products in the acetylene illumination of field hospitals thus have an immediate and positive value. Both generators use the same size of calcium carbide, No. 14, which is also the size used in the new acetylene illuminating apparatus adopted recently by the Signal Corps for night signalling. This is a point of advantage in connection with emergency supply.

Chemically, sixty-four parts by weight of carbide require thirty-six parts of water, producing seventy-four parts of slaked lime and twenty-six parts by weight of acetylene gas. In practice, however, generators of the best type require water in the proportion of one gallon of water to one pound of carbide. This is necessary to prevent the heating up of the apparatus during the generation of the gas and also to ensure the rapid and even production of the latter; for like quick-lime, calcium carbide becomes very hot when acted upon by water. The generation of acetylene under conditions of high temperature is undesirable, as this gas is partially converted into other polymeric substances, like benzol, C_6H_6 , and styrolene, C_8H_8 , which not only by so much reduce it in quantity but also injure its quality by their presence. These and similar by-products cause the gas to burn with a persistent smoky flame and in part deposit a solid tarry residue at the point where the heating takes place. Converting measures of weight into bulk, one pound of commercial calcium carbide may be expected to yield five cubic feet of acetylene gas at ordinary pressure and temperature.

Acetylene is a colorless gas, possessed of a penetrating odor similar to that of garlic; but this odor is not perceptible during combustion, and should it be detected about an apparatus in operation it may be regarded as due to a faulty joint, open cock, or leaky pipe. Acetylene burns free in the air with a brilliant but smoky flame. When its illuminating power is properly brought out with a suitable burner, it yields a light of greater brilliancy than is furnished by any other gas. All hydrocarbons burn in air with production of carbon dioxide and watery vapor, but the quantity of combustion products compared with the volume of gas burned varies with the character of the hydrocarbon used. The combustion equation of acetylene is:

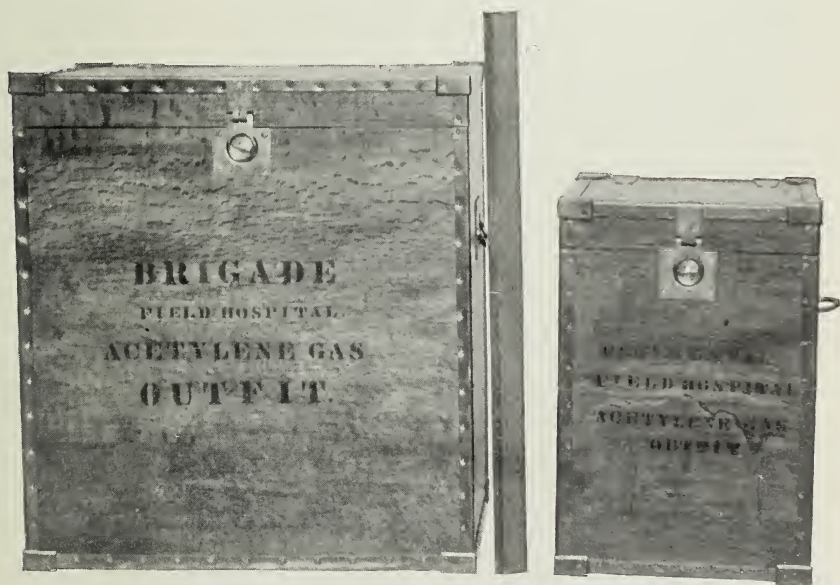


Or one cubic foot of gas burned deprives the surrounding air of two and one-half cubic feet of oxygen and throws into it two cubic feet of carbon dioxide and one of watery vapor. For the same amount of light produced, acetylene deprives the air of oxygen and produces carbon dioxide to the extent of only about one-fourth as much as coal gas. This is highly important in considering the vitiation of air in an enclosed space, as a barrack room, though of course is of no importance in connection with the illumination of tent hospitals. As with all inflammable gases, acetylene is capable of exploding if mixed with air before ignition, a mixture containing about $7\frac{1}{2}\%$ exploding with the greatest violence. With present types of generators, however, there is no more danger of an explosion with acetylene than with coal gas. The ignition point of acetylene is about 900 degrees F., where that of coal gas is 1100 degrees F.; the temperature of an acetylene flame is 1800 degrees F., where that of coal gas is 2450 to 2500 degrees F. Acetylene has high illuminating powers, while coal gas contains gases which burn with the generation of a high amount of heat but which give off little if any light. The lower temperature of the acetylene flame is an important point where the overheating of tents or buildings in hot weather is a matter for consideration; and is very favorable to

the use of acetylene under such circumstances. Cubic foot for cubic foot, acetylene has about thirteen times the illuminating power of coal gas.

It is necessary to use a special burner with acetylene in order to supply sufficient air to result in complete and smokeless combustion; and also to prevent the burner from becoming too hot and causing the gas to polymerize in the way already mentioned, with the deposition of solid matter and the clogging of the passages with soot. Controlled by a suitable burner, the flame of acetylene is absolutely white and of intense brilliancy. In quality, it is the nearest approach to day-light known. Its spectrum closely resembles that of sunlight, and consequently all colors appear the same as by daylight, instead of being distorted as by the light from gas, candles, oil or electricity. This quality, together with the clear definition of objects brought under its influence, makes illumination by acetylene of particular value for surgical work, and especially for operations implicating the abdominal cavity. The possibility of concentrating a large amount of light is also a matter of the utmost advantage in field surgery, as any desired amount of light can be thrown on the field of operation from one or more clusters of burners. A single cluster of four burners, with reflector, can be made to furnish a light equal to 200 candles or 20 lanterns, and gives a brilliant light sufficient for the accomplishment of the most delicate surgical work. Obviously this means a tremendous advance in the possibilities of field surgery over the old days when a large artery like the femoral was tied by the light of a single candle, necessarily held so close that the hot grease scalded the hands of the operator and flesh of the patient, or where a delicate bit of brain surgery had to be done by the scanty light which could make its way through the dirty glass of one or two lanterns. How great the intensity of light yielded by the field acetylene illuminating outfit really is can be readily appreciated from the accompanying night photographs of the U. S. Army Field Hospital at the Pan-American Exposition, taken by the acetylene light itself. In the photograph of the

office tent, shown elsewhere, lighted by two $\frac{3}{4}$ foot burners of 37-candle power each, even the titles of the books on the field desk could be read without difficulty. In all these night photographs, the clearness with which the objects photographed are defined and the sharpness of the shadows cast are very apparent. Certainly it means much to the operating surgeon to have an abundance of light of this excellent character immediately available under all conditions of field service where



Chests containing full brigade and regimental acetylene illuminating outfits.

A two-foot rule appears in the photograph to show the size of these chests.

lanterns can be carried, and the recent equipment of the Medical Department with apparatus for producing such a light will contribute largely to the comfort and welfare of patients and to the ease of administration of field hospitals.

The cost of acetylene illumination is necessarily made up of two elements—the first cost of the generator and its appurtenances and the current expense for calcium carbide. The first factor of original outlay is small, the regimental field hospital illuminating outfit costing in the neighborhood of

\$35.00 complete. The generator of this outfit alone retails at \$15.00. If made up in quantity, the parts could of course be sold more cheaply than at present. As to calcium carbide, the present cost of this material is in the neighborhood of \$2.50 per hundred-weight in any part of the United States. Since a pound of carbide yields, as a fair estimate, five cubic feet of gas, the cost of illumination, outside of first cost for apparatus, is 0.5 cent per cubic foot. The ordinary acetylene burner consumes one-half a cubic foot of gas hourly, giving a

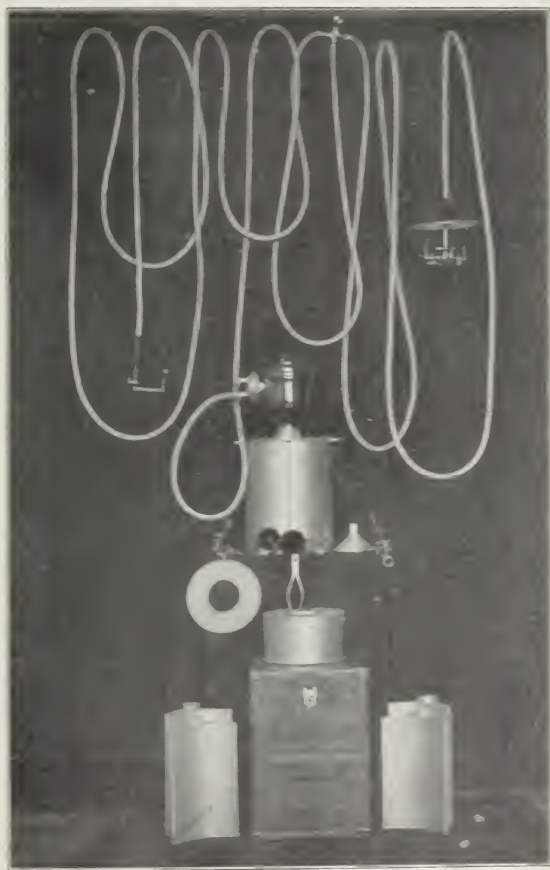


Chests containing full brigade and regimental acetylene illuminating outfits, packed for transportation.

light equal to 25 standard candles, and at a cost of 0.25 cent per hour. Taking coal-gas to cost the unusually low amount of one dollar per thousand cubic feet, and the ordinary flat gas burner to use six cubic feet hourly in furnishing a light of but 20 candle power, it is seen that coal gas costs 0.75 cent per hour per 25 candle-power light, or three times as much as acetylene. With respect to mineral oil, with which acetylene should be compared in the field, it is obvious that the first cost

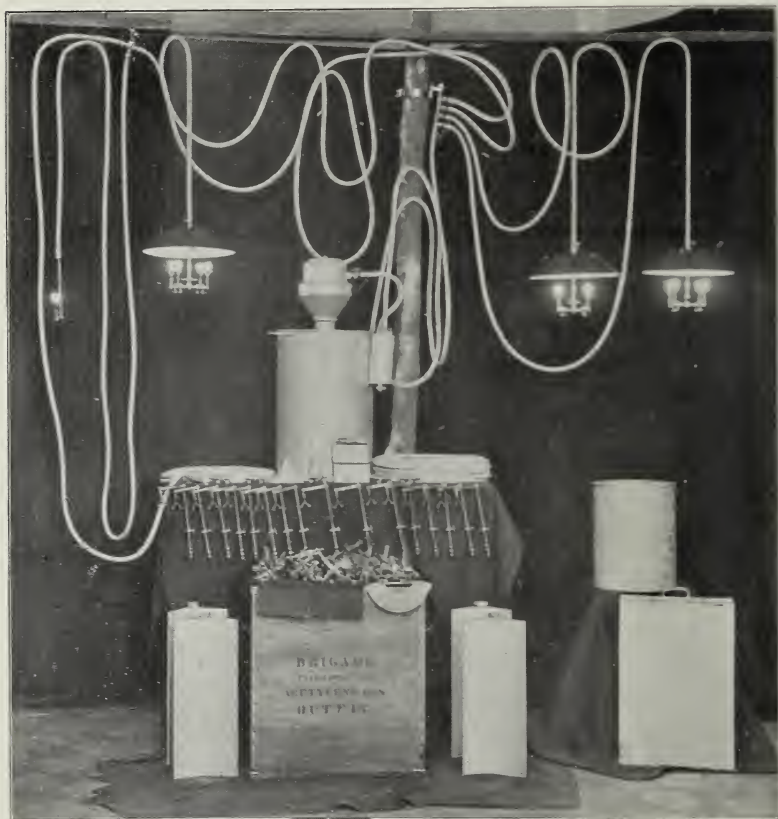
of the acetylene outfit, based on illuminating power, is sufficient to purchase somewhat more than an equivalent number of lanterns. The latter are, however, more liable to loss and breakage. Compared with the consumption of mineral oil by the regulation lanterns, and the light derived therefrom, the Quartermaster authorities state that a 12-candle power lantern uses two ounces of mineral oil hourly, or equivalent to four ounces of oil per hour for an illumination of 25 candle power. With oil at 8 cents per gallon, the cost is thus 0.34 cent per hour — or forty per cent. greater than with acetylene for the same amount of light.

Some have questioned the use of acetylene in the field, on the ground that it was necessary to carry a supply of calcium carbide with the command in order to render the apparatus of use. This is an objection which applies equally to mineral oil, candles, ammunition, rations, clothing, or any other



Regimental field hospital acetylene illuminating outfit, unpacked for display.

article forming part of the equipment of the soldier. As compared with mineral oil, calcium carbide occupies only one-fourth the space, considering the light obtained. Allowing four ounces of mineral oil to produce 25 candle power light in lanterns hourly, one gallon of oil, occupying a cubic space of 231 cubic inches,



Daylight photograph of brigade field hospital acetylene illuminating outfit, unpacked for display.

In addition to the three operating lights shown in the photograph, the generator is capable of running the ward drop burners displayed on the front of the table.

would be sufficient for 32 hours; while ten pounds of calcium carbide occupy but 225 cubic inches, and would yield 50 cubic feet of acetylene gas capable of running a 25 candle-power light for 100 hours. From the standpoint of transportation, acetylene illumination in field hospitals is thus much to be preferred to that from mineral oil.

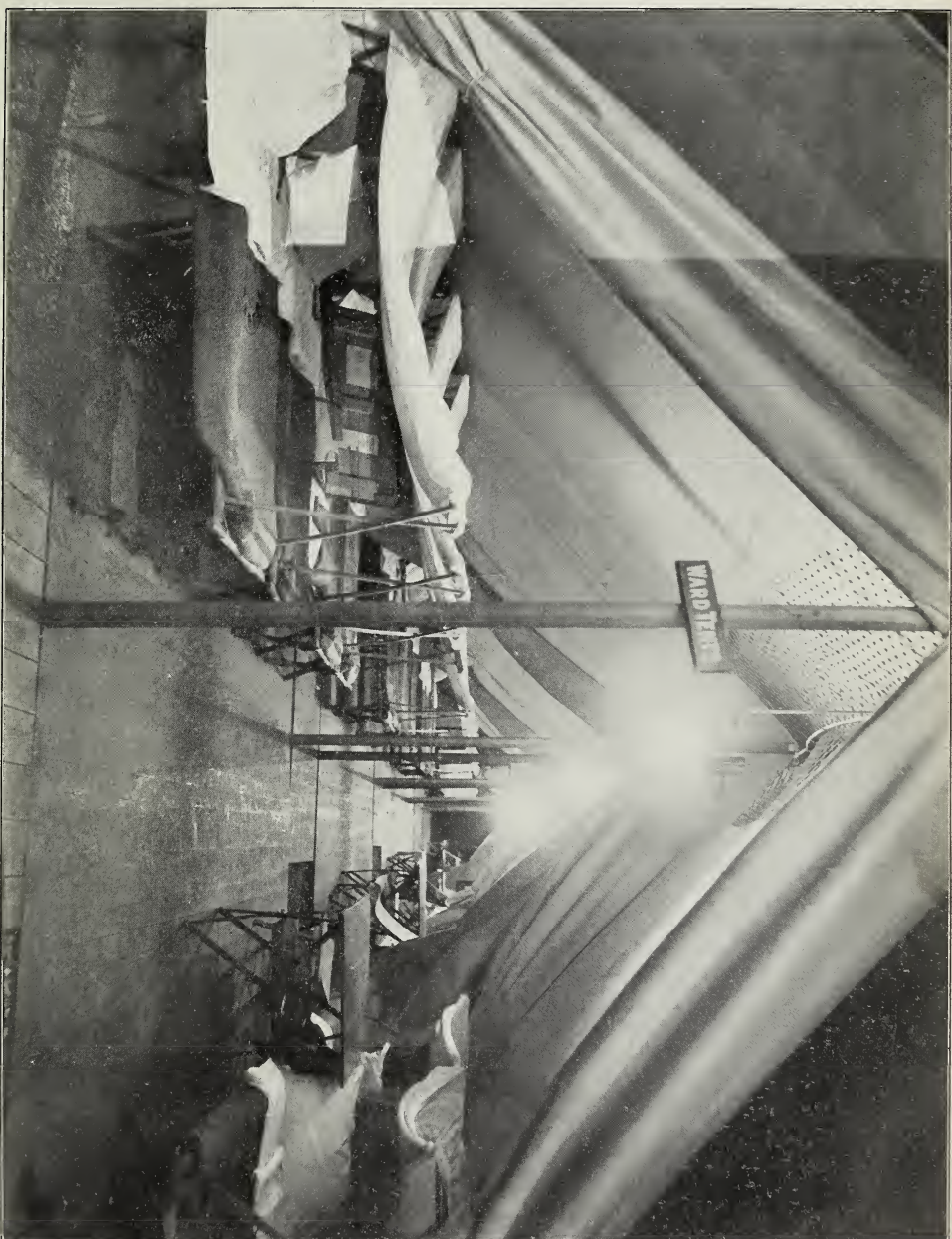


Photograph of office tent of the U.S. Army brigade field hospital, Pan American Exposition, taken at night by acetylene illumination from a double drop burner. The shortness of the exposure is evidenced by the flight of rockets shown above the tent. The small generator, regimental hospital size, is shown underneath the field desk. An operating cluster of four burners could, in addition, be run by this generator.

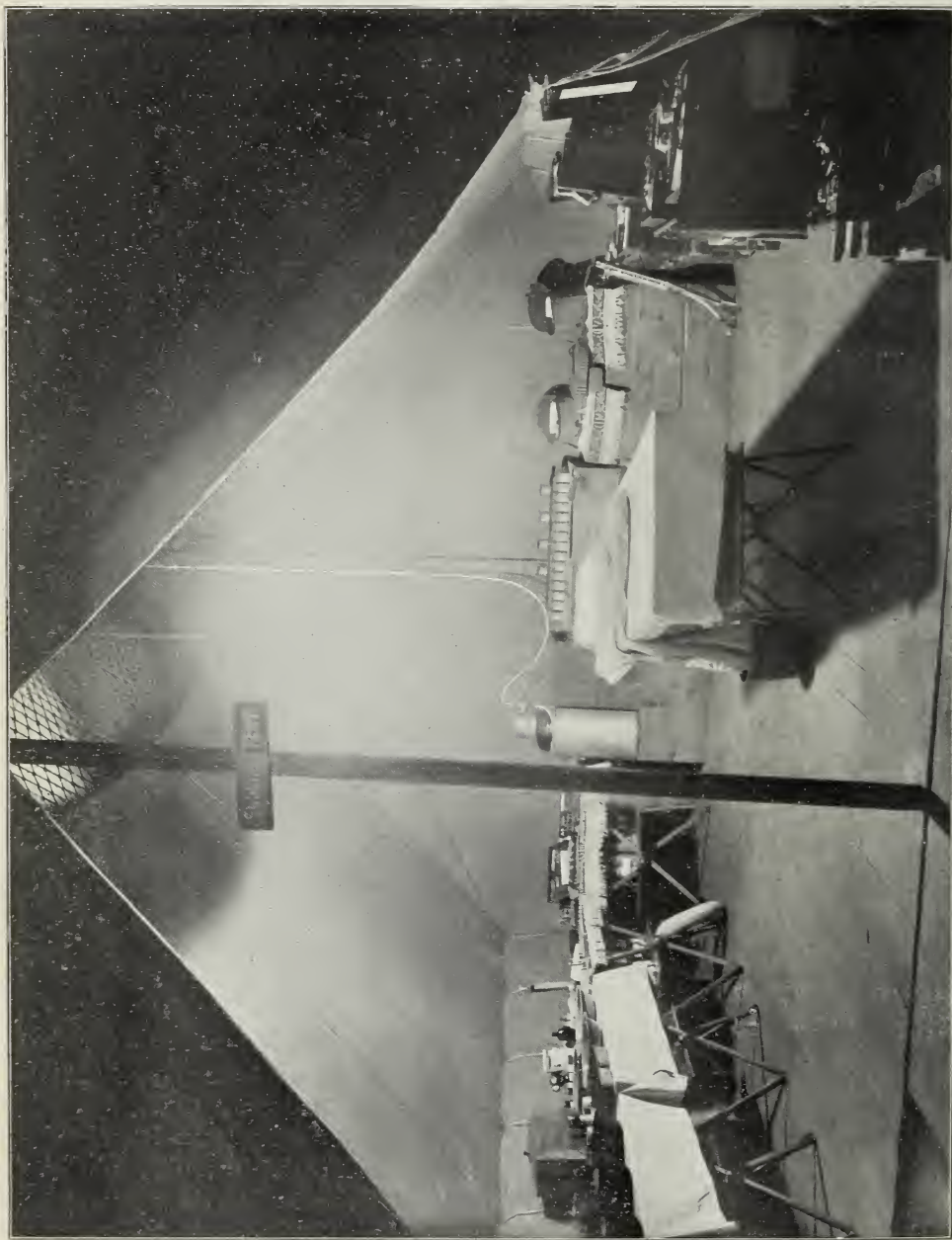
The regimental field hospital acetylene illuminating outfit is packed in its entirety in an oaken, brass-bound chest 16½ inches high and 11¼ inches square on the base. The weight of the outfit complete, including a supply of calcium carbide sufficient to operate the apparatus for five nights, is about 50 pounds. The parts of this outfit, as shown in the accompanying photograph, are as follows: 4 canisters for calcium carbide; rubber distributing tube, 50 feet; 1 water bucket, with handle; 6 extra acetylene burner tips; 1 metal can, for holding extra parts; carbide magazine, automatic feed; extra rubber diaphragm; 1 operating cluster of 4 burners, with reflector; 1 dryer and filter; 2 pieces of felt, extra; 1 single drop burner; 1 funnel; 1 gas-bell; pincers; 3 distributing pipes, two- and three-way; 1 water container; 1 tube of white lead.

The above list appears very extensive from the number of individual articles named; but as a matter of fact they can be packed with great ease and rapidity. All the smaller articles are not liable to injury and are packed by being simply dropped together into the metal container, which in turn is covered with a lid and set into the water bucket. The latter is set into the water container; and outside the water-bucket but inside the water container is placed the gas-bell, into the top of which the carbide feed magazine has previously been screwed in an inverted position. The whole is then lifted up and placed in the wooden chest, the excess space in the corners of which are occupied by four reservoirs containing a reserve supply of calcium carbide sufficient to operate the apparatus for five nights. The rubber tubing for the distribution of the gas is then coiled around the top of the gas-bell, inside the water container, and the chest closed.

The brigade field hospital acetylene illuminating outfit is packed in its entirety, together with a supply of calcium carbide sufficient to operate the apparatus for five nights, in a brass-bound oaken chest weighing about 140 pounds and being 20 inches long, 14½ inches wide and 21½ inches high. The parts of this apparatus, as shown in the accompanying photograph, are practically the same as in the regimental outfit, except that they are of larger size. Of course, more burners, sections of junction pipe, and feet of rubber tube are provided



Photograph of a ward in the U. S. Army brigade field hospital, Pan American Exposition, taken at night by acetylene illumination. Each tent is illuminated by a single drop burner.



Photograph of surgical display tent of the U. S. Army brigade field hospital, Pan American Exposition, taken at night by acetylene illumination. The generator shown at the rear of the tent is capable of running two additional operating light clusters of four burners each and the single drop burners for wards shown in the accompanying photograph.

in this larger outfit. The method of packing is much the same as with the smaller chest, but the small parts go in a single container which rests in the chest beside the generator, while the space thus gained inside the latter is utilized to contain the larger amount of rubber distributing tube required.

In character, the generators for both the regimental and brigade field hospitals are practically the same except in size, and differ otherwise only in a few minor features. Briefly, the generator consists of an outside metal can or water container, in which is placed a metal water-bucket having a diameter about an inch less than the inner diameter of the outer can. The inner bucket is provided with a wire bail for convenience in handling. When ready for operation, this bucket is nearly filled with water and the space between it and the outside can is also filled with water to within two or three inches of the top of the former. Placed over the inside bucket, so that a water seal is formed by the water between the inner and outer buckets, is the gas-bell, tapering at the top where the carbide feed magazine is screwed into it. The latter is top-shaped, and is closed at the bottom with a metal plug connected by a shaft with the metal plate forming the top of the carbide magazine. This metal plate is attached to the magazine by a rubber diaphragm, so that it may oscillate up and down, and when so moving it pushes down and pulls up the plug in the bottom of the magazine—allowing pulverized calcium carbide to sift through the opening in the latter or closing off the supply, as the case may be. The operation of the apparatus is as follows:

The magazine being filled with calcium carbide through the opening in the top, gravity causes the plug in the bottom of the magazine to fall, allowing a pinch of carbide to sift down from the magazine into the water, on meeting with which there is an immediate decomposition with the evolution of acetylene gas. This causes an increase of the internal pressure in the generator, the gas passes up through the space through which the carbide is sifting and also through the hollow shaft connecting the plug and top plate of the magazine. This increase of the internal pressure forces the dia-

phragm upward, which by this movement pulls up the plug snugly into the aperture in the bottom of the carbide magazine and prevents the passage of any more carbide into the water reservoir. The acetylene gas, escaping from the gas-bell through the carbide magazine, is filtered and dried by being passed through felt, and is then conducted through tubes to the point where illumination is required. As the gas is used, the interior pressure in the gas-bell is gradually diminished, until there comes a time when this internal pressure is no longer capable of supporting against gravity the weight of the diaphragm and its attachments. As the diaphragm falls, the plug closing the bottom of the magazine is moved downward, a little carbide sifts through into the water, acetylene gas is formed, the internal pressure rises and operates to shut off the admission to the water of any more carbide. The whole operation is thus automatic—the carbide being decomposed in the production of acetylene gas only as fast as the latter is utilized. If no lights are burned, the operation of the apparatus is brought to a standstill; if ten lights are burned, the carbide is allowed to pass into the water reservoir at a rate ten times faster than if only a single light were in operation. There is thus no wastage of carbide under any circumstances, and at the same time there is no over-generation of gas. As with lanterns, the length of the period during which the apparatus will give light without recharging depends upon the amount of the illuminant burned. There is a limit to the amount of oil contained in a lantern and to the calcium carbide placed in an acetylene generator, and this limit is reached more or less rapidly as a greater or less number of burners are supplied from a single apparatus. The number of pounds of calcium carbide in the generator, multiplied by 5 (the number of cubic feet of acetylene gas one pound of carbide will produce) and multiplied by 2 where $\frac{1}{2}$ foot burners are used, equals the number of 25 candle-power hours. The regimental outfit thus contains 2 pounds of carbide, which yield 10 cubic feet of gas, which will run an operating cluster of 4 burners, of 25 candle power each and each requiring $\frac{1}{2}$ foot of gas per hour, for 5 hours—or it will run a single burner of 25 candle power for 20 hours. The intention of the writer in getting up the outfits was not to make the generators unnecessarily large, but to make them of such

a size as would keep them very portable and still have sufficient power to meet *all or any* of the needs of field surgery and the *necessary* requirements of field hospitals. To increase the size and weight of the apparatus beyond a certain point simply means that no apparatus at all could be carried in the field—but it is believed that very satisfactory outfits have been made within what may be fairly considered the maximum limits of weight and space for field conditions.

Accidents and explosions are impossible with the perfected type of generator adopted, for the gas pressure inside the apparatus can never be greater than that of a few inches of water composing the water-seal—in the regimental outfit the height of this column of water is but ten inches—and should a considerable quantity of carbide be dropped into the water intentionally or by a blow upon the top of the generator the only result would be that the sudden increase of the interior pressure would force out the water of the water-seal and cause it to spatter up over the gas-bell. The apparatus is thus not only simple in construction and operation but is absolutely safe. It is necessary to pass the gas through a felt filter to remove moisture and any minute particles of lime which may be carried up by the ascending gas, since otherwise this lime dust will collect at the burners and interfere with combustion, producing a smoky flame and a deposit of carbon, while the moisture may collect at the lower part of the distributing pipe and interfere with gas pressure.

The rubber distributing tube is carried from the generator along the ridge pole from tent to tent, being quickly fastened to the ridge pole at about the centre by a few turns of a thumb screw clamp, to the bottom of which is affixed a three-way pipe with stop-cocks. The two top pipes serve for the junction of the distributing tubes, while the third pipe serves for the attachment of a short drop tube with a single burner or operating light cluster. Screw clips hold the rubber and metal pipes together, and prevent their being pulled apart by gravity or accident. The apparatus can of course be set up and the lights distributed through a house as readily as through a tent hospital, if desired. Stop cocks shut off the supply of gas to any single burner, group of burners, or main distributing pipe.

With respect to the time, knowledge and care required to set up the field hospital illuminating outfits and keep them in operation, it may be safely said that the acetylene outfits can be unpacked, the junctions made, the tubing and burner distributed through the tents, and the whole apparatus put into full operation much sooner than would be the case if it was required to fill, trim and distribute lanterns of equal illuminating capacity. After the apparatus, tubes and fixtures are once in position, the only care required daily consists in refilling the carbide magazine, emptying out the bucket containing the milk of lime formed as a by-product in the generation of acetylene, and refilling the bucket with fresh water. The time required to recharge the apparatus and put it in a condition to operate for the following night need not exceed two or three minutes, or about the time required to clean, fill and trim a single lantern. The immense saving of time and labor by the use of acetylene in large field hospitals after the first installation of the apparatus, as compared with the use of lanterns, is thus a powerful argument in its favor. The packing up of an outfit is a somewhat longer task than putting it into operation, as care must be taken to coil the distributing pipe evenly so as to avoid kinks. The regimental field hospital outfit can readily be unpacked and put into operation, with one single drop burner and one operating cluster, in two or three minutes, but it cannot be properly taken to pieces and packed up under five or six minutes. The large outfit for a 108 bed hospital would of course require a proportionately longer time for making connections, distributing its pipe or for reassembling its parts for packing and transportation—but the whole matter even with the large outfit is one of a few minutes only.

In conclusion, the writer believes that the new portable acetylene field illuminating outfits proposed by him approach the ideal standards, formulated above, as nearly as may be in the present state of knowledge on the subject. He feels assured that their recent incorporation in the field hospital equipment of the Medical Department cannot but prove of very great advantage in the field surgery and hospital administration of the future.

Reprints and Translations.

THE REORGANIZATION OF THE BRITISH ARMY MEDICAL SERVICES.

THE much mooted reorganization of the British Royal Army Medical services is finally settled by a Royal Warrant recently promulgated to the Army with the approval of the Secretary of State for War, which we quote practically in full:

ARMY MEDICAL SERVICE.

WHEREAS WE deem it expedient to amend the Regulations relating to the Appointment, Promotion, Pay, and Non-effective Pay of Officers of our Army Medical Service:

OUR WILL AND PLEASURE is that the Warrant of Our late Royal Mother, dated the 26th October, 1900, shall be amended in accordance with the following provisions:—

The Director-General of Our Army Medical Service and the other officers of our Army Medical Staff shall hold the substantive rank of SURGEON-GENERAL.

The undermentioned officers shall rank as follows in relation to combatant officers for the purposes specified in the King's Regulations:—

AS LIEUTENANT-GENERAL	- -	Surgeon-general holding the appointment of Director-General, Army Medical Service.
AS MAJOR-GENERAL		{ Chaplain-general. } Surgeon-general.

In cases of distinguished service in the field a departmental officer may, with the concurrence of the Lords Commissioners of Our Treasury, be promoted from any rank or class to that next above it, and shall, if promoted to a rank or class having a fixed establishment, remain supernumerary in such rank or class until the occurrence of the vacancy to which, in the ordinary course, he would have been promoted.

An officer so promoted into a rank or class, with progressive rates of pay, shall not receive a further increase of pay in that rank or class until he becomes entitled thereto by service.

In a case of distinguished service in the field for which an officer may merit special reward, although there may not be sufficient grounds for his promotion, Our Secretary of State shall, if the officer is serving in a rank or class with progressive rates of pay and is not already in receipt of the highest rate, have the power, with the concurrence of the Lords Commissioners of Our Treasury, to grant him a higher rate of pay in his rank or class, but without alteration of his seniority.

APPOINTMENT.

Commissions as lieutenants in Our Royal Army Medical Corps shall be given, on the recommendation of our Commander-in-Chief, to persons duly qualified under regulations approved by Our Secretary of State. The commissions shall bear the date of the officers' appointment as lieutenants on probation.

Commissions as quartermasters in Our Royal Army Medical Corps shall be conferred upon warrant officers of that corps under certain specified conditions

SECONDED OFFICERS.

A lieutenant on probation who, at the time of passing the examination for admission to Our Royal Army Medical Corps, holds, or is about to hold, a resident appointment in a recognized civil hospital may be seconded for the period, not exceeding one year, during which he holds the appointment. While seconded he shall not receive pay from Army funds, but his service shall reckon towards promotion, increase of pay, gratuity, and pension.

PROMOTION.

An officer shall be eligible for promotion to the rank of captain on the completion of $3\frac{1}{2}$ years' service, and to the rank of major on the completion of 12 years' service, provided that in each case he has previously qualified in such manner as may be prescribed by Our Secretary of State.

Promotion to the rank of lieutenant-colonel shall be made

by selection from officers who have completed at least 20 years' service, and have qualified in such manner as may be prescribed by Our Secretary of State.

If an officer has passed with distinction the examination qualifying for promotion to the rank of major, the period of service required to render him eligible for the rank of major or lieutenant-colonel may be reduced as follows:

	Months.
If he obtained a "special certificate" - - - - -	18
If he passed in the 1st class - - - - -	12
If he passed in the 2nd class - - - - -	6
If he passed in the 3rd class . . . - - - -	3

A lieutenant in Our Royal Army Medical Corps, promoted to the rank of captain before the date of this Our Warrant, on account of distinguished service in the field, shall be eligible for further promotion to the rank of major, and subsequently to that of lieutenant-colonel, when the officer next below him in the rank of captain or major completes 12 or 20 years' service respectively. A captain so promoted to the rank of major shall, on the same conditions, be eligible for promotion to the rank of lieutenant-colonel.

An officer who may in the opinion of Our Secretary of State have been prevented, under very special circumstances, from qualifying for promotion, or who, having failed to qualify, may have been debarred from further opportunity of qualifying, may be provisionally promoted. If, however, he fails to qualify on the first available opportunity his promotion shall be cancelled, and he shall be retired from Our service.

An officer of Our Royal Army Medical Corps, who has exchanged or been transferred from Our Indian Military Forces shall reckon subject to conditions, his previous service with the said forces towards promotion, increase of pay, gratuity, and pension.

An officer of Our Royal Army Medical Corps shall be eligible for promotion to brevet rank.*

**Secretary of State's Instructions.*—Distinction in original investigation or research may, in the case of an officer of the Royal Army Medical Corps, be regarded as "distinguished service of an exceptional nature other than in the field."

Promotion to the rank of colonel shall be made by selection from lieutenant-colonels who have been specially selected for increased pay, and from lieutenant-colonels, or surgeon-lieutenant-colonels of Our Household Troops, specially recommended to Our Secretary of State for distinguished service in the field.

Promotion to the rank of surgeon-general shall be made by selection from colonels.

A colonel may also be promoted to the rank of surgeon-general for distinguished service in the field.

The promotion of an officer for distinguished service in the field, shall be governed by specified conditions.

The appointment of director-general of Our Army Medical Service shall be for 3 years, unless the term is specially extended by Our Secretary of State for a further period not exceeding 2 years.

SUPERNUMERARY LIST.

An officer who does not qualify for promotion to the rank of captain or major, within periods specified shall be placed on the supernumerary list until he qualifies or is retired from Our Service under specified conditions. Service on the supernumerary list shall not reckon towards promotion, increase of pay, gratuity, or pension.

KING'S HONORARY PHYSICIANS AND HONORARY SURGEONS.

Six of the most meritorious officers of Our Army Medical Service shall be named Our Honorary Physicians, and six Our Honorary Surgeons. On appointment as one of Our Honorary Physicians or Honorary Surgeons, an officer under the rank of colonel in Our Royal Army Medical Corps may be promoted to the brevet rank of colonel.

EXCHANGES AND TRANSFERS.

An officer of Our Royal Army Medical Corps shall be permitted to exchange with another officer of such corps, or with a medical officer of Our Household Troops, under such conditions and regulations as may from time to time be made by Us.

Exchanges between officers of Our Royal Army Medical Corps under the rank of major and medical officers of Our Indian Military Forces, and transfers of such officers from either of the above services to the other, shall only be permitted

subject to the approval of Our Secretary of State for India in Council, and on the following conditions:

- (1.) That the officers have less than 7 years' service.
- (2.) That the senior officer exchanging takes the place of the junior on the list, and shall not be promoted until the officer next above him has been so promoted.
- (3.) That the junior officer exchanging is placed for seniority next below all medical officers whose commissions have the same date as his own.
- (4.) That the officer transferred is placed for seniority below all medical officers holding the same rank at the time of his transfer, and shall not be promoted until the officer next above him has been promoted.

PAY, ADDITIONAL PAY, AND CHARGE PAY.

The following shall be the rates of pay, additional pay, and charge pay of the officers of Our Army Medical Staff and Royal Army Medical Corps, etc.

	Inclusive of all Allowances except Field and Travelling Allowances.
ARMY MEDICAL SERVICE.	Yearly.
<i>At Headquarters.</i>	£
DIRECTOR-GENERAL - - - - -	2,000
DEPUTY DIRECTOR-GENERAL - - - - -	1,500
ASSISTANT DIRECTOR-GENERAL - - - - -	850
DEPUTY ASSISTANT DIRECTOR-GENERAL - - - - -	750
	Exclusive of Allowances.
<i>At other Stations.</i>	Daily.
	£ s. d.
SURGEON-GENERAL - - - - -	3 0 0
COLONEL - - - - -	2 0 0
LIEUTENANT-COLONEL - - - - -	1 10 0
LIEUTENANT-COLONEL specially selected for increased pay after at least 8 years service abroad.	1 15 0
MAJOR - - - - -	1 3 6
After 3 years' service as such - - - - -	1 6 0
CAPTAIN - - - - -	0 15 6
After 7 years' total full pay service - - - - -	0 17 0
After 10 years' total full pay service - - - - -	1 1 0
LIEUTENANT ON PROBATION AND LIEUTENANT ADJUTANT of Our Royal Army Medical Corps (Volunteer) - - - - -	0 14 0
QUARTERMASTER - - - - -	The pay of his rank. As a quartermaster of infantry.

A lieutenant-colonel appointed one of Our Honorary Physicians or Honorary Surgeons, *shall receive pay at the rate laid down for a colonel of Our Royal Army Medical Corps when qualified for promotion to that rank.*

A captain of Our Royal Army Medical Corps holding the brevet rank of major shall receive pay at 2s. a day in addition to the rates laid down for a captain.

Additional Pay.

Officer not serving on the headquarters staff appointed a member of the Advisory Board	£150 a-year.
Officer serving as Secretary of the Advisory Board and Nursing Board - - -	£100 a-year.
	s. d. Daily
Officer under the rank of lieutenant-colonel holding an appointment as specialist -	2 6
Quartermaster in charge of the medical stores at Woolwich - - - - -	2 6

Charge Pay.

(a) Officer in charge of a general or other hospital; or of a division of a general hospital—

	s.	d.	Daily.
If in charge of at least 50 beds - - - -	2	6	
“ “ 100 “ - - - -	5	0	
“ “ 200 “ - - - -	7	6	
“ “ 300 “ - - - -	10	0	

(b) Officer in command of the depot, Royal Army Medical Corps - - - - - 5 0

(c) The senior officer of Our Army Medical Service with an army in the field—

A rate to be fixed by Our Secretary of State according to the magnitude of the charge.

(d) In a command abroad— s. d.

The senior medical officer, if the number of soldiers is 1,500 or upwards - 5 0

EXTRA-DUTY PAY.

An officer of Our Royal Army Medical Corps, appointed to act as adjutant or quarter-master of Our Royal Army Medi-

cal Corps (Militia) during preliminary drill or training, shall receive extra-duty pay at the following daily rates:—

	s.	d.
Acting adjutant - - - - -	2	6
Acting Quartermaster - - - - -	2	0

RESERVE OF OFFICERS.

On the completion of 3 years' service, an officer of Our Royal Army Medical Corps may be permitted by our Secretary of State to become an Army Reserve officer for a period of 7 years; and while so serving he shall receive pay at the rate of £25 a year.

With the sanction of Our Secretary of State, such officer may be allowed to return to the active list, and if the period he has been in Our Reserve of Officers amounts to at least 1 year, and not more than 3 years, he shall be allowed to reckon one-third of such period towards promotion, gratuity and pension.

PAY DURING SICK LEAVE.

An officer of Our Army Medical Staff or Royal Army Medical Corps may be allowed full pay during sick leave of absence.

MEDICAL OFFICERS OF THE REGIMENTS OF HOUSEHOLD TROOPS.

Appointment.

A major or lieutenant-colonel of Our Royal Army Medical Corps may, on the nomination of the titular colonel of the regiment, be transferred from his corps into the rank of surgeon-major or surgeon-lieutenant-colonel respectively in one of Our regiments of Household Troops.

Promotion.

A surgeon-major shall be eligible for promotion to the rank of surgeon-lieutenant-colonel on completing 20 years' service, provided that he has previously qualified in such manner as may be prescribed by Our Secretary of State.

Promotion to the rank of brigade-surgeon-lieutenant-colonel shall be made by seniority on the medical establishment of the brigade.

A surgeon-major may be promoted to the rank of surgeon-

lieutenant-colonel for distinguished service in the field, under specific conditions.

Exchanges.

A medical officer of Our Household Troops may be permitted to exchange with an officer of Our Royal Army Medical Corps, provided that an officer exchanging into Our Royal Army Medical Corps has fulfilled any conditions as to service abroad required of officers of such corps.

Pay.

The rates of pay of medical officers of Our Household Troops shall be as follows:—

	£	s.	d.
Brigade-surgeon-lieutenant-colonel	1	15	0
Surgeon-lieutenant-colonel	1	10	0
Surgeon-Major	1	3	6
After 3 years' service as such	1	6	0

A medical officer of Our Household Troops shall be eligible for extra pay.

General Regulations.

In all matters not provided for the medical officers of Our Household Troops shall be governed by the general regulations for regimental officers of Our Army.

RETIREMENT.

(a.) *Voluntary Retirement.*

CONDITIONS OF RETIREMENT.

An Officer of Our Army Medical Service, or a medical officer of Our Royal Malta Artillery, may be permitted to retire, in cases in which such retirement may be deemed expedient by Our Secretary of State.

SCALE OF RETIRED PAY.

Army Medical Staff.

	£	s.	d.	Daily.
SURGEON-GENERAL	2	0	0	
<i>Royal Army Medical Corps and Medical Officers of Household Troops.</i>				
COLONEL	1	15	0	
LIEUTENANT-COLONEL, or Surgeon-lieutenant-colonel of the Household Troops—				
After 20 years' service	1	0	0	
“ 25 “	1	2	6	
“ 30 “	1	5	0	

LIEUTENANT-COLONEL, after having been in receipt £ s. d.
of the increased pay allowed for 3 years, or brigade-
surgeon-lieutenant-colonel of the Household Troops—

Under 30 years service	-	-	-	-	-	1	7	6
After 30	"	-	-	-	-	1	10	0

MAJOR, or surgeon-major of the Household troops—

After 20 years' service	-	-	-	-	-	1	0	0
After 25 years' service, if his service reckoning for promotion is insufficient to qualify him for promotion to the rank of lieutenant-colonel	-	-	-	-	-	1	2	6

Gratuity.

MAJOR OR CAPTAIN—

After 5 years' service in the rank of captain,	£	1,000
After 10 years' service, if the officer was commis- sioned before the date of this Our Warrant		1,250
After 3 years' service in the rank of major, or, if the officer was commissioned before the date of this Our Warrant, after 15 years' service	-	1,800
After 6 years' service in the rank of major, or, if the officer was commissioned before the date of this Our Warrant, after 18 years' service	-	2,500

Surgeon-lieutenant-colonel or surgeon-major of the
Household Troops—

After 15 years' service	-	-	-	-	-	1,800
" 18 "	-	-	-	-	-	2,500

Medical Officers of the Royal Malta Artillery.

All ranks—retired pay equal to the half-pay of the officers' rank.

Except in the case of a lieutenant-colonel, an officer of Our Army Medical Service, who, on voluntary retirement, has served for less than 3 years in the rank from which he retires, shall be entitled only to the gratuity or retired pay assigned to the next lower rank.

(b) *Retirement on account of Age, or Limitation of Period of Service.*

CONDITIONS OF RETIREMENT.

The Director-General of Our Army Medical Service shall retire on completion of the term of his appointment; and the retirement of other officers of Our Army Medical Service (ex-

cept quartermasters) shall be compulsory at the following ages:

Surgeon-general	- - - - -	60
Colonel, <i>promoted to the rank on or after the date of this Our Warrant</i>	- - - - -	57
Colonel, <i>promoted to the rank before the date of this Our Warrant</i>	- - - - -	60
Other officers	- - - - -	55

A major shall retire on completion of 25 years' service; or, if he fails to qualify for promotion, on the completion of 20 years' service.

A captain or lieutenant shall retire on completing 6 months' service on the supernumerary list.

A medical officer of Our Royal Malta Artillery shall be compulsorily retired on attaining the age of 55.

It shall be competent to Our Secretary of State to place a medical officer on the retired list after 30 years' service.

SCALE OF RETIRED PAY.

DIRECTOR-GENERAL, ARMY MEDICAL SERVICE.—After three years' service as director general—with 30 years service £1,125 yearly.

OTHER OFFICERS OF OUR ARMY MEDICAL SERVICE AND MEDICAL OFFICERS OF OUR ROYAL MALTA ARTILLERY.—Same rates as under “(a) VOLUNTARY RETIREMENT,” except that the condition of 3 years' service in the rank shall be omitted, and that, in the case of a surgeon major of Our Royal Malta Artillery, his retired pay, if retired on account of age, shall be 17s. 6d. a day, irrespective of service.

(c) *Retirement on Account of Medical Unfitness.*

CONDITIONS OF RETIREMENT.

An officer of Our Army Medical Service, or a medical officer of Our Royal Malta Artillery placed on the half-pay list on account of medical unfitness shall, if not previously retired, be retired from Our Army at the expiration of 5 years from the date on which he was placed on the half-pay list, or, if reported by the regulated medical authority to be permanently unfit for duty, on the officer's application, at such earlier date as may be decided by Our Secretary of State.

An officer, whether on full or half pay, placed in detention as a person of unsound mind, shall be retired from Our Army, with the retired pay to which he would be entitled if reported by the regulated medical authority to be permanently unfit for duty. If his disability was not caused by military service, and he is not entitled to permanent retired pay by length of service, he shall receive temporary retired pay equivalent to the half-pay, and temporary retired pay, if any, which he would have received if his disability had been other than insanity.

SCALE OF RETIRED PAY.

DIRECTOR-GENERAL ARMY MEDICAL SERVICE.—Under 3 years' service as director-general, and after not less than 30 years' service, £875 yearly.

OTHER OFFICERS OF OUR ARMY MEDICAL SERVICE AND OF OUR ROYAL MALTA ARTILLERY.—Same rates as under “(a) VOLUNTARY RETIREMENT,” except that the condition of 3 years' service in the rank shall be omitted; and that in the case of a surgeon-major of Our Royal Malta Artillery his retired pay, if retired on account of medical unfitness, shall be 17s. 6d. per day, irrespective of service.

Rates for Officers not Qualified for Retired Pay on Voluntary Retirement.

If the unfitness was caused by military service—retired pay equal to the half-pay of his rank.

If not so caused; provided the officer has at least 12 years' service—retired pay equal to the half-pay of his rank, for such period only, not exceeding 5 years from the date of the officer's retirement from Our Army, after 5 years on half-pay under *Article 306, as Our Secretary of State shall determine according to the merits of the case.

Given at Our Court at - - - this 24th day of March 1902, in the 2nd year of Our Reign.

By His Majesty's Command.

Secretary of State's Instructions.

The term “rank” when used in the foregoing Royal Warrant, means “substantive rank” unless otherwise stated.

*The numbers of the articles and the references to other articles, except in the present instance have been omitted in this reprint.

Officers who have served with the Royal Army Medical Corps (Militia) when embodied, or who, as officers of the Royal Army Medical Corps (Militia) or Royal Army Medical Corps (Volunteers), medical officers of Yeomanry or Volunteers, or as civil surgeons, served with an army in the field, after the 1st October, 1899, may be allowed to reckon such service toward retired pay and gratuity.

Commander-in-Chief.

COMMENT BY THE BRITISH MEDICAL JOURNAL.

It must be admitted that on first reading it is a somewhat disappointing document, for there is no reference to be found in it to several of the points as to which definite information is most eagerly looked for by the Service and by young members of the profession who are thinking of the army as a possible career. The details as to the various examinations to be passed for entrance and promotion are not yet forthcoming. Nothing is said as to any projected increase in the strength of the Royal Army Medical Corps, and the vital question of Indian pay is not touched upon. The explanation of this latter omission is, we understand, that in a legislative sense India lies outside the scope of Royal Warrants. The regulations as to examinations, with which the question of study leave is bound up, will, we believe, be published at once. The provision of a remedy for the present undermanned condition of the Corps, and the proposal that junior officers should for the first few years of their service be attached to regiments are, we presume, among the matters which are left to the discretion of the Secretary of State for War. It will be noted, further, that no mention is made of the Advisory Board, which has been in active existence for some months. That body, in fact, would appear to resemble the Cabinet, which theoretically has no place in the British Constitution.

It is impossible here to give a critical analysis of the Articles of the Warrant. And until the fullest information has been furnished as to matters not dealt with in the Warrant, it would be rash, and might be misleading, to express a definitive judgement on the value of the scheme of reorgani-

zation of the Army Medical Services as a whole. All that can profitably be done at the present stage is to give a rapid summary of the more important points of the document before us. For the sake of convenience we follow the order of the Warrant, though the Articles might have been more logically arranged.

As regards rank, the Director-General is to be the equal of a Lieutenant-General, instead of a Major-General as heretofore. But this advance in title only partially expresses the higher position in the military hierarchy to which the Director-General has been raised. He is now placed on an absolutely equal footing with the heads of departments on the headquarters staff. In the *Monthly Army List* for March the office of the Director-General of the Army Medical Service is printed in the same type as is used for those of the Director-General of Mobilization and Military Intelligence, the Adjutant-General to the Forces, the Quarter-master-General to the Forces, the Inspector-General of Fortifications, and the Director-General of Ordnance. This question of typography may appear trivial, but to the military mind the promotion from "pearl" to "long primer" has a world of meaning. The Director-General is now a member of the War Office Council, and also of the Army Board. The head of the Army Medical Service has now, therefore, a position in the army corresponding to the dignity of his office and to his responsibility. This in itself constitutes a reform of the most far-reaching importance.

Passing next to the other end of the scale of rank we are able to state positively, that the entrance examination is to be confined to clinical medicine and surgery. By this means it is hoped to secure a class of sound practical men, likely to make efficient officers, who would be deterred from offering themselves as candidates by disinclination to go through the drudgery of getting up the details of anatomy, physiology, and other elementary subjects. The commissions of officers entering the service are in future to bear the date of their appointment as lieutenants on probation; this means that the

time spent at Netley will be reckoned towards promotion, so that an officer may attain the rank of captain on the completion of three years and a-half service. In accordance with the principle of attracting a class of men who have hitherto been to a large extent kept out by the inelastic rules previously in force, candidates who at the time of passing the entrance examination hold or are about to hold resident appointments in civil hospitals may be seconded for the period during which they hold such appointments. The interminable vista of examinations for promotion which was so objectionable a feature in the scheme drawn up by Mr. Brodrick's "Committee of Experts" has been reduced to limits which need not terrify a well-trained medical officer, even if he has little taste for the "bookish theorick." For promotion to Captain a test in knowledge of the administrative duties of a medical officer is required. For promotion to Major an examination must be passed in medicine, surgery, hygiene, bacteriology, and one special subject selected by the candidate. If an officer passes this examination "with distinction" his promotion to the rank of Lieutenant-Colonel will be accelerated by a period varying from three to eighteen months; this period of service will count towards the pension to which the officer becomes entitled on retirement. For promotion to Lieutenant-Colonel an examination in military law and other administrative subjects must be passed. Beyond the rank of Lieutenant-Colonel promotion will be entirely by selection, or for distinguished service in the field.

A novel and very important point in the new warrant is that officers of the R.A.M.C. are now eligible for promotion to brevet rank as a reward for special service. Hitherto this system of promotion, which exists in the combatant ranks of the army, has been unknown in the Royal Army Medical Corps; hence a man could not be promoted for distinguished service except by passing over the heads of a certain number of officers, and thus inevitably creating a feeling of dissatisfaction among them. It is also satisfactory to note that in the case of an officer of the Royal Army Medical Corps regard

may be had to "distinguished service of an exceptional nature other than in the field," which may be held to qualify for selection for promotion to the rank of Colonel. Promotion to the rank of Surgeon-General is to be made from Colonels by selection or in recognition of distinguished service in the field.

In regard to pay, the proposals made in Mr. Brodrick's scheme have been generally adhered to. It will be noted that the titles of the headquarters Staff have been altered so as to assimilate them to those of the corresponding officers in the other departments of the War Office. The Surgeon Generals are not to receive consolidated pay as originally proposed. The increase of pay in all the other ranks except that of Colonel remain substantially as recommended. It may be mentioned that a brevet Major gets 2s. a day in addition to his captain's pay. Officers who qualify as "specialists" in obstetrics, ophthalmology, laryngology, and so forth receive 2s. 6d. a day in addition to the pay of their rank. Charge pay is given as in the scheme, but with this important modification, that it is to be drawn by officers in charge of a general or other hospital or *of a division of a general hospital*. The Senior Officer of the Medical Service with an army in the field will receive charge pay in accordance with the magnitude of his charge.

As regards retirement, the Director-General is appointed for a term of three years, which may be specially extended for a further period not exceeding two years. Surgeon-Generals are compulsorily retired at the age of 60; Colonels, if promoted to the rank on or after the date of the Warrant, at 57, or if before, at 60; other officers at 55. A Major must retire on completion of twenty-five years' service, or if he fails to qualify for promotion, after twenty years. This provision safeguards the pension of £1 a day to which so much importance is justly attached by the service. It was the ambiguity as to this essential point that more than anything else made Mr. Brodrick's original scheme unacceptable. Officers who do not qualify for promotion to the rank of Captain or Major at the proper time are to be placed on the supernumerary list

till they succeed in doing so; if they fail after six months' service on the supernumerary list they are to be compulsorily retired. The rates of retired pay of the various ranks and of gratuities to officers of the rank of Major are set forth in the Warrant; the only remark that need be made is that a gratuity of £1,000 is given after five years' service in the rank of Captain, making the total period required to qualify for the gratuity a little more than eight years.

These are the main features of the new Warrant. Our view of it may be conveyed in a paraphrase of the opinion of Falstaff's doctor about the fat knight's water. For the Warrant itself, it is a good Warrant—as far as it goes; but all depends on the spirit in which it is administered by the War Office. We have said that it is good “as far as it goes;” but it must be admitted that it does not go very far. Before we can honestly say that the Medical Service of the Army in its reorganized condition offers a fair career to young men who have in them the capacity for achieving professional success, we must have definite assurances that the strength of the Corps will be raised to a degree sufficient to allow a reasonable amount of leave to all officers, and that the long-standing grievance as to Indian pay will be removed. In this matter no vague promises, no optimistic trust in official statement will serve. The Indian Government, if it cannot be compelled by Royal Warrant to be equitable to medical officers, must have *force majeure* applied to it in some other way. Mr. Brodrick may take it from us that no scheme of reorganization of the Medical Services of the Army will be accepted by the profession which does not include provisions for the removal of this gross injustice—provisions that cannot by any official shuffling or obstinacy be evaded.

Medico=Military Index.

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Rear-Admiral Presley Marion Rixey, Surgeon General United States Navy.

Editorial Department.

SURGEON GENERAL PRESLEY MARION RIXEY,
UNITED STATES NAVY.

THE inevitable change consequent upon the progress of time has brought to the head of the naval medical department one of its most distinguished and capable officers in the person of Rear Admiral Presley Marion Rixey, who was appointed Surgeon General on the tenth of last February. Admiral Rixey was born in Culpeper county, Virginia, on the fourteenth of July, 1852 and received his early education at schools in Culpeper and Warrenton. His family identified itself with the Confederate cause during the civil war which brought financial ruin upon its members in company with so large a proportion of our old southern families. Undaunted by difficulties, however, he sought and achieved an education, both general and professional, receiving the doctorate in medicine from the University of Virginia in 1873. He then undertook to extend his practical acquaintance with his profession by attendance upon clinics and hospitals in Philadelphia during the remainder of the year, presenting himself before the naval examining board early in 1874 as a candidate for appointment in the medical corps of the Navy.

He was commissioned Assistant Surgeon in the navy on the twenty-eighth of January, 1874 and set out upon that long period of service which has just been crowned with the highest honors attainable in his corps. He was first assigned to duty on the Receiving Ship "Sabine," but soon transferred to the "Congress," then on the European station and later at the Centennial Exposition at Philadelphia, where she represented the navy. He was detached in 1876 and ordered to the Philadelphia Naval Hospital where he remained until he passed

his examination for promotion to the grade of Passed Assistant Surgeon in 1877. He then took station at the Norfolk (Va.) Navy Yard as attending surgeon, where he served until assigned to a three years' tour of special duty on the "Tallepoosa" in 1879. He was on the flagship "Lancaster" from 1884 to 1887 on the European and South Atlantic Stations, and on the "Dolphin" from 1893 to 1896. During the Spanish war he applied for active sea duty, but his services were deemed so essential in Washington that he could be spared only to make a brief voyage to Cuba on the ambulance ship "Solace." The twelve years of service not enumerated above were passed on special duty as attending surgeon at Washington. In 1888 he was promoted to the grade of Surgeon and in 1900 to that of Medical Inspector.

During his long service in Washington he was honored with the confidence of many of the most prominent men of the country, and for the last three years was physician to the Executive Mansion. It was in especial recognition of the value of his distinguished services in the latter capacity that President McKinley promised him the surgeon-generalcy of the navy when the next vacancy should occur, a promise which President Roosevelt fulfilled. In connection with his duty at the Executive Mansion, it became necessary for him to accompany the President upon all journeys taken by the Chief Executive, and thus it happened that he was in Buffalo when President McKinley was assassinated. He had been detailed by the President to accompany Mrs. McKinley to the Milburn House, whilst he received the people, so that he was not immediately at hand when the President was shot, but was promptly summoned so that he was present and assisted with the operation, and took official charge of the case. Here he displayed in the highest degree those qualities which evidenced not only professional acquirements of an extensive range, but executive ability and diplomatic faculties of a remarkable character. The skill and devotion which he displayed in the management of the case of the President and the almost equally exacting case of the President's invalid wife won for him the admiration and affection of the entire country.

Admiral Rixey is a member of the American Medical Association and a member by invitation of the Washington (D. C.) Medical Society. He has been an active member of the Association of Military Surgeons since 1895, and during the present year has served as a member of the Executive Committee.

On the occasion of an explosion on the Spanish Caravel "Santa Maria" in the harbor of New York in 1893 he rendered prompt and generous assistance to the officers and crew of the vessel, a courtesy which the King of Spain, Alfonso XIII, recognized by decorating him with the Order of Naval Merit.

His thorough understanding of the needs of the service is evinced by his prompt application to Congress for a material increase in the number of his corps. His request is accompanied by evidence of the necessity for the desired action so convincing that there can be no doubt of favorable action upon it. The accession of Admiral Rixey augurs good fortune for the naval service and particularly for the medical department, which is sure to be developed and advanced by the sagacity, tact and ability which has characterized all the official acts of his successful career.

JAMES EVELYN PILCHER.

GREATER CARE IN INVESTIGATING THE ANTECEDENTS OF CANDIDATES FOR THE ARMY MEDICAL CORPS.

WHEN, some years ago, the Army Medical Examining Boards held their sessions in the large cities from which the majority of candidates for commissions in the Army Medical Corps were drawn, the members of the board made it a part of their duty to personally investigate the character, habits and professional standing in the community of the young men who presented themselves for examination. Later, the Army Medical Examining Board convened in Washington, the young men who appeared before it, were drawn from all sections of the country and this highly important personal investigation of their character and morals

could not be made. Under Army Regulations each candidate was of course obliged to present letters of recommendation from two reputable citizens, but such letters were easily to be obtained, and the Board was forced to base its estimate of the character of candidates almost wholly on the brief acquaintance gained during the course of the examinations. In 1898, Captain E. L. Munson, who was recorder of the Examining Board then in session, addressed letters of inquiry, with respect to all candidates, to the deans of the institutions from which they were graduated and also to the secretaries of the medical societies in the communities of which these candidates were resident, stating that any information received in reply would be held strictly confidential. This system of inquiry has been continued by the Surgeon General's office down to the present time and has resulted in much valuable information being received by the examining boards. In his present work as recorder of the examining board, which recently began its sessions, Captain Munson has extended this system so that a more complete knowledge of candidates can be secured. Army medical officers serving at posts or as attending surgeons in large cities will be required by letter from the Surgeon General's office to carefully investigate into the character of candidates resident in their vicinity and make report thereon. At places where no medical officers are stationed, the local recruiting officer will be asked to make this investigation and report. In addition, letters will be addressed to several medical officers of the National Guard, members of the Association of Military Surgeons, requesting them to make confidential reports to the Surgeon General as to the fitness of these candidates for commission in the Medical Department of the Army. Through these various channels it is expected that such full information will be gained that examining boards in the future need make no mistakes in their recommendation of candidates for appointment. The new plan has the further benefit of practically using the medical officers of the national guard as auxiliaries to the medical officers of the regular service and bringing them more

closely in touch with each other; and at the same time making the former practically stand sponsor for the character of the young medical men admitted to the Medical Corps of the Army.

PRESENT DAY MILITARY MEDICAL JOURNALS.

THE United States, while advanced in general journalism, unexcelled in medical journalism and at the front in military journalism, has allowed itself to be surpassed in military medical journalism for many years. During more than a quarter of a century the Swedish Association of Military Surgeons has been ably represented by its *Tidskrift* while for a decade the Japanese Association of Military Surgeons has regularly issued its *Gun Igaku Kwai Zasshi*, bearing to its members at frequent intervals the best work of the medico-military profession of the world.

The JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS has many precedents to justify its existence, for military medical journalism was not slow to present itself even in the infancy of periodical publication. At the present time every important country with the exception of England has its journal devoted to medico-military science.

The *Archives de médecine et de pharmacie militaires* (Paris, France) published by order of the French Minister of War is a thin octavo (9x5½ inches, untrimmed) in a dark blue cover, now in its thirty-ninth volume and twentieth year of publication under its present form, although its entire history dates much farther back to the time when in 1815-16 it was issued as the *Journal de médecine, de chirurgie et de pharmacie militaires*, changing in 1817 to the *Recueil de mémoires de médecine, de chirurgie et de pharmacie militaires*, which style it retained until 1882 when it took on its present form,—making a total period publication of eighty-eight years, during which it has contributed enormously to the advancement of French military medicine.

The *Archives de médecine navale*, the naval equivalent of

the *Archives de médecine et de pharmacie militaires* is published by order of the Minister of Marine, and is now in its sixty seventh semi-annual volume of about 480 pages. It is of octavo size ($9 \times 5\frac{1}{2}$ inches, untrimmed) and published monthly.

In addition to the foregoing official medico-military journals, published directly under governmental supervision, the French have a non-official journal, *Le Caducée*, a semi-monthly quarto ($13 \times 9\frac{1}{2}$ inches, untrimmed) to which we have already referred somewhat at length. *Le Caducée* makes a special feature of abstracts of articles relating to military medicine which have appeared in other periodicals, and is a particularly bright and progressive journal.

The *Giornale Medico del Regio Esercito* is a monthly of about a hundred pages published under the supervision of the Italian War Ministry at Rome at 12 lire per annum. It is an octavo ($8\frac{1}{4} \times 5\frac{1}{2}$ inches, trimmed) and is now in its forty-ninth year of publication. Its contents are not restricted to technically military medical subjects, which indeed are rather conspicuous by their absence, and it is evidently designed to take the place occupied by the general medical journals in the repertory of the American military surgeon.

The *Annali di Medicina Navale* is a handsome journal published under the official patronage of the Italian Minister of Marine also at Rome. It is now in its eighth year and its fifteenth volume of six numbers, each numbering about 150 pages. Like its analogue of the War department, it is not technically military but covers the field of medicine in general.

The *Deutsche Militärärztliche Zeitschrift* of Berlin was established in 1872 and is now in its thirtieth year of successful publication. It is a monthly, octavo ($9\frac{3}{4} \times 6\frac{1}{2}$ inches, untrimmed) of fifty-six pages with a monthly supplement of official orders and changes of station. Its senior editor, Dr. von Leuthold has just been appointed surgeon general of the German army in place of the lamented von Coler. It is distinctly official in character and is one of the chief instruments which the German military organization so judiciously employs in the work of developing the efficiency of the medical department of its mighty military system.

The *Militaerarzt* is a semi-monthly supplement to the *Wiener medizinische Wochenschrift* and appears in 8 page quarto ($13 \times 9\frac{3}{4}$ inches) form. It is now in the thirty-fifth year of publication, devoted to the elevation of Austrian military medicine. A similar *beilage* was for many years furnished to the subscribers to the *Wiener medizinische Presse*, the other great Vienna medical weekly, but the writer is unable to state whether it is still issued or not.

Das Rothe Kreuz is not strictly a military medical journal but its importance in first aid work brings it into close contact with military administration. It is a quarto ($12\frac{1}{4} \times 9\frac{1}{4}$ inches) of twenty pages and has been published in Berlin for nineteen years.

The Slav is active in medical journalism and the *Voyenno meditsinski Journal* of St. Petersburg is a large octavo ($10 \times 6\frac{1}{4}$ inches, untrimmed), which has a history dating back to 1823. Numerous references to its contents are found in our Medico-Military Index, showing the practical and useful character of the matter regularly furnished to its readers.

The *Archives médicales belges, organe du corps sanitaire de l'armée*, published at Brussels, is now in its fifty-fifth year. It is a monthly octavo ($8\frac{1}{2} \times 5\frac{1}{2}$ inches, untrimmed) of about eighty pages per number, well edited and well written, showing that a distinctly progressive character marks the work of the Belgian military surgeon.

The *Militair-Geneeskundig Tijdschrift* of Haarlem is the organ of the medical officers of the Dutch army. It is edited by a strong editorial committee, composed of officers of the military and naval services, and has department editors in charge of military surgery, military hygiene, naval medicine, tropical affections, military pharmacy, veterinary practice, red cross work, etc. It was established in 1897 and is published in octavo ($9\frac{1}{2} \times 6\frac{1}{2}$ inches, untrimmed) quarterly numbers of about 64 pages each.

The *Tidskrift i Militär Hälsovård*, the organ of the Swedish Association of Military Surgeons, is an attractive octavo ($9 \times 5\frac{3}{4}$ inches, untrimmed), issued quarterly at Stockholm. It

has been a most important factor during the twenty-six years of its publication, in achieving for the military surgeons of Sweden the strong position and high reputation which they enjoy. It is excellently arranged, carefully edited and furnishes about 500 pages of text each year.

The *Finsk Militär Tidskrift*, published at Helsingfors accomplishes for the military forces of Finland what has been undertaken by the Norwegian and Swedish journals for other Scandinavian territory.

The *Norsk Tidskrift for Militär Medicin* is another example of the progressive character of Scandinavian military medicine. It is published in Kristiania under the direction of Lieutenant General Thaulow, surgeon general of the army and navy of Norway, and edited by Captain Daal, an accomplished officer of his staff.

The *Gun Igaku Kawai Zasshi*, which may be translated as *Journal of the Association of Military Surgeons* of Japan, is a handsome octavo ($8\frac{1}{2} \times 5\frac{3}{4}$ inches, trimmed) which has now been published for ten years in Japanese text. It is an index to the high grade of work done by our oriental confreres and an encouragement to the further persistent development of the Journal of our own Association.

La Medicina Militar Española, y Revista de clinica y de terapéutica y farmacia of Madrid, a semi-monthly octavo ($9\frac{1}{4} \times 6\frac{1}{2}$ inches, untrimmed) of 16 pages, now in the twenty-seventh year of its publication, is the representative of the medical officers of the Spanish army and deals very largely with tropical affections.

The *Revista de Sanidad Militar* is "a publication devoted to the scientific and professional interests of the Spanish Military Sanitary Corps" and is now in its sixteenth volume. It is issued semi-monthly as an octavo ($9\frac{1}{2} \times 6\frac{1}{2}$ inches, untrimmed) of about twenty pages, and is also published at Madrid. A feature of this journal is a *feuilleton*, individually paged to form a separate book upon its completion. The series goes under the general title of "Biblioteca de la Revista de Sanidad militar." The subject of the present serial is a General



The Military Medical Journals of 1902.

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| 1. Deutsch Militaerarzt-
liche, Zeitschrift. | 2. Le Caducée. | 3. Annali di Medicina
Navale. | 4. Tidskrift i Militar
Halsovard. |
| 5. La Medicina Militar
Espanola. | 6. Indian Medical Gazette. | 7. Giornale Medico del Regio
Esercito. | |
| 8. Voyenno meditsinski
Journal. | 9. Journal Military Surgeons,
United States. | 10. Archives de medecine et
de pharmacie militaires. | 11. Der Militaerarzt. |
| 12. Das Rothe Kreuz. | 13. Revista de Sanidad Militar. | 14. Anales de Sanidad Militar. | |
| 15. Gun Igaku Kwai
Zasshi. | 16. Archives de mede-
cine navale. | 17. Militair-Genes-
kundig Tijdschrift. | 18. Archives medicale
belges. |

Study of the Fractures produced by the Projectiles of Small Arms, by Dr. Miguel Slocker de la Pola.

The *Anales de Sanidad Militar* of Buenos Aires is a monthly octavo (6x8½ inches trimmed) of about a hundred pages, with an imposing editorial corps and a subscription price of one peso per month. It is now in its third year of publication.

The *Bulletin International des sociétés de la croix-rouge*, published by the *comité international*, of which M. Gustave Moynier is president, at Geneva, is an octavo (9x6 inches, trimmed) issued quarterly. It presents about 64 pages in each number, of matter bearing mainly upon military medical administration enclosed between handsome covers of red and white.

The *Indian Medical Gazette*, while not a professedly military medical journal is edited by officers of the British Indian Medical service and appeals largely to the officers of that service, who in turn contribute freely to its interesting and valuable pages, so that it is actually more military in its character than some of the self-declared medico-military publications. It is one of the most valuable of the series.

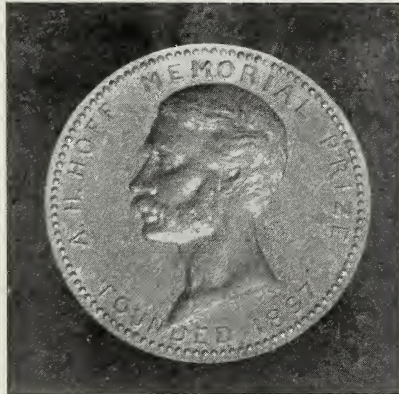
It will be seen then that the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, far from being unique in its character and aims, is only one of a large number of publications with similar purposes, which have been published for from four to four score years, forming for us a history of military medicine, which is ever worthy to be studied.

THE ARMY MEDICAL SCHOOL.

THE sessions of the Army Medical School, after an unavoidable suspension of four years, on account of the demands of the Spanish war and the Philippine hostilities, were resumed last fall and at the Commencement last month the largest class in its history was graduated. The principal feature of the occasion was the address by General Sternberg, the founder of the institution, upon its functions. After emphasizing the signal and too often unrecognized im-

portance of the work of the medical officer in maintaining the combatant efficiency of an army, he commented upon the agency of the army medical school in preparing its graduates for authoritative recommendations with regard to the avoidance and suppression of those diseases which have been found by experience to present the greatest dangers as regards the health of troops and the efficiency of armies.

"The measures," he remarked, "to be taken for the prevention of disease among our soldiers naturally fall under two principal headings, viz: (a) Those which relate to the maintenance of a high standard of resisting power on the part of the units of the individual army; and (b) those which relate to protection of these individuals from infection by any of the various disease germs, which have been proved by experience to be the principal causes of sickness among soldiers. Under the first heading we consider food, ventilation and heating



The Hoff Memorial Medal.

of barracks, exercise, etc. The second involves a precise knowledge of the morphological and biological characters of all known disease germs, of the mode in which they gain access to the human body, and of the best means of destroying them. * * * We now know that disease germs are not disseminated through the atmosphere of infected localities, and, having precise knowledge of where to find them and how to kill them, are able to formulate directions for the prevention of those pestilential diseases which, if fully carried out, would no doubt lead to their utter extinction. We have a recent example of the im-

portance of precise knowledge with reference to the mode of transmission of an infectious disease as a basis for measures of prophylaxis, in the discovery that yellow fever is transmitted by mosquitoes of the genus *Stegomyia*." After alluding to other recent discoveries in connection with infection he continued by referring to the fact that the student officers "learn to recognize the various disease germs by the use of the microscope and of culture methods; they learn to differentiate between the mosquito that serves as an intermediate host for the germ of malarial fever and of yellow fever; they are instructed as to the best methods of destroying these pernicious insects or of protecting soldiers from infection through their stings; they learn to detect the presence of pathogenic microorganisms or of injurious inorganic impurities in drinking water; they learn to make an early diagnosis in malarial fever, typhoid fever, bubonic plague, diphtheria, etc., by use of scientific methods," some of them of very recent discovery. He impressed upon the class the important opportunities for investigation opening up before them, suggesting as questions for study: "What are the essential factors in the etiology of beri-beri, of sprue, of tropical ulcers? What are the principal harmful parasites in our new possessions? Why is it that malarial fevers prevail in the more elevated regions rather than in the vicinity of the paddy fields of valleys near the sea level? What is the principal habitat of *Amœba dysenteriae* outside of its human host?" He noted the important function of the medical officer in instructing the line upon the essentials in averting epidemics, referring *en passant* to the need for ample teaching in hygiene at West Point, and closed by showing the young officers that it was for them to sustain and perpetuate the high ideals as to duty and loyalty both to the country and to the medical corps of the army, which had been so worthily upheld by their predecessors, and assured them that they had just reason to be proud of the fact that they had been admitted to a *corps d'élite*, access to which could only be obtained through merit, — continuing in words so wisely stated that they should be held in memory

by every member of the corps: "You will find that officers of the line and of other staff corps are always ready to treat you with the consideration due you as officers of the army and members of a learned profession, unless in some way, by your own actions, you forfeit their esteem or good will. Let your conduct always be such that they will not only recognize and rely upon your professional skill, but will honor and confide in you as gentlemen '*sans peur et sans reproche*.' Be loyal to your superiors, and just to your inferiors, painstaking and thorough in all you undertake, not over-exacting as to your rights and privileges, and never enter upon a controversy, personal or official. unless you are sure that you are right and that the subject is of sufficient importance to justify you in an effort to prove it. Never fail to respond to professional calls in the families of officers and enlisted men on the ground that they are not entitled to your services or that the ailments complained of are trivial; it is much better to make unnecessary visits than to gain the ill will of those who summon you believing your professional assistance is necessary. Do not seek personal advantages through irregular channels. The chief of your corps can best judge whether a particular assignment which you may desire would conflict with the interests of the service or the rights of others. If not, and in his judgment your request is reasonable, it will always give him pleasure to grant it. But an attempt to escape a duty or to secure an assignment through outside influences show an indifference to the best interests of the service and the rights of others and is evidence of disloyalty to the chief of the corps which can not fail to give him an unfavorable opinion of one who would resort to such methods. Finally, do not forget to apply practically the knowledge of hygiene which you have acquired for the preservation of your own health. Aside from any personal interest you may have in the matter, it is your duty to do so; for, if you contract a preventable disease through your own neglect of the proper measures of prophylaxis, or are prematurely retired from the service for Bright's disease, cirrhosis of the liver or some other

chronic ailment caused by excesses of any kind, you deprive the government of the services of a valuable trained officer."

A most interesting feature of the program was the awarding of the Hoff Memorial Gold Medal endowed by the President of this Association, Lieutenant Colonel John Van Rensselaer Hoff, in memory of his father, Surgeon A. H. Hoff in his day one of the most distinguished members of the army medical corps. The medal was conferred by the founder in person upon Lieutenant James M. Phalen, who had attained the highest average of scholarship during the course. Of this medal the *Army and Navy Register* in its issue of April 5 publishes a handsome engraving which we are permitted to use in the JOURNAL, and accompanies it with a fine view of the faculty and student officers and several interesting snapshots showing the actual work of the institution.

The diplomas were presented by the Secretary of War with a few well chosen words of congratulation upon the opportunity afforded the class of enjoying the two highest privileges in life,—to serve humanity and to serve one's country. He cordially recognized the value of the work of the army medical department and closed with a comment upon the difficulty of maintaining the present high standard of excellence. In concluding the exercises, the Commanding General of the Army paid a high tribute to the medical department which he regarded as the most popular branch of the service, in whose members professional acquirements were no less conspicuous than the courtesy and kindly spirit which had so endeared them to their comrades.

THE SANITARY SERVICE OF THE NORWEGIAN ARMY.

A HANDSOMELY printed *brochure* for which we are indebted to the courtesy of Lieutenant General Thaulow, Surgeon General of the Norwegian Army and Marine, gives an excellent account of the sanitary service of the army of that country.

The organization of the Norwegian army is based upon the principal of universal military service.

The sanitary service is organized along military lines whether for peace or war and is in every respect conformable to the other services of the army. The chief of the sanitary service is a General officer—since 1901, a Lieutenant General—and holds the same relation to his corps as other chiefs of staff departments.

The military surgeons are commissioned officers; and are of two kinds, those of the permanent establishment and those who are serving their time with the colors.

All medical students are assigned to the sanitary department when they come up for military service; it will thus be possible in case of war to bring into the field any number of trained military surgeons that may be necessary.

The non-commissioned officers, corporals and privates, are also of two categories. All young men assigned to the sanitary service are instructed and drilled, but the non-commissioned officers of the permanent establishment are given special instruction along more extended lines.

For *Bearers* are selected men strong in every particular. Their drills are of the same duration as those of young infantry soldiers.

The *Nurses* are taken from among men assigned to auxilliary service.

In the combatant branches of the army,—instructed by the personnel of the sanitary service attached to these branches,—are the *regimental bearers* who remain with their own organizations and are not detached for sanitary service until just before battle.

PERSONNEL OF THE SANITARY SERVICE.

The personnel of the sanitary service is divided between the combatant forces and the special forces of the sanitary service. The latter comprise:

COMPANIES OF THE SANITARY SERVICE.

1 Captain, commanding, mounted; 4 Lieutenants, of whom 2 are mounted; 1 Sub-Lieutenant (of transportation) mounted,

detached from the military transportation corps; 1 Sergeant major; 1 Q. M. Sergeant; 6 Bearer Sergeants; 2 Nurse Sergeants; 10 Bearer Corporals; 2 Nurse Corporals; 1 Sergeant of transportation, mounted; 1 Corporal of transportation, mounted; (these two detached from the transportation corps); 2 Trumpeters; 96 Bearers; 6 Nurses; and the following detached from the transportation corps; 1 Saddler; 1 Tailor, 1 Shoemaker; 4 Ordnance soldiers, 11 Pioneers.

FIELD HOSPITALS.

100 BEDS.

1 Captain, commanding, mounted; 2 Lieutenants; 1 Pharmacist; 1 Steward; 3 Nurse sergeants; 3 Nurse corporals; 6 Nurses; 2 Cooks; 1 Ordnance soldier and 6 Pioneers, detached from the transportation corps.

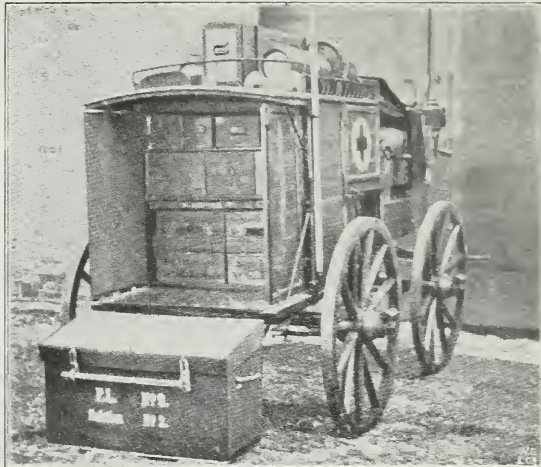
STATIONS, (ÉTAPES).

1 Major commanding; 1 Lieutenant, aide-de-camp.

Together with: 6 Captains; 10 Lieutenants; 1 Sub-Lieutenant, detached from the transportation corps; 1 Administration clerk; 2 Stewards; 2 Pharmacists, 1st class; 2 Pharmacists,

2d class; 1 Surgical Instrument Maker; 20 Sergeants; 24 Corporals; 60 Nurses; 8 Cooks,—distributed among the various stations and railway transports of each station.

The organization is the same for all three divisi-



Four-wheeled Surgical Wagon.

ons of the service,—the line, the *landvern* and the *landstorm*.

EQUIPMENT.

Like the personnel, the equipment is divided between the sanitary troops and the combatant forces.

EACH COMPANY OF THE SANITARY SERVICE.

2 Surgical wagons; 2 baggage wagons; 6 ambulances, 2 horses. The ambulance contains 1 canvas covered compartment with 2 movable cushions for patients sitting, and 8 litters, of which the canvas, slings, etc., are placed in the am-



Four-wheeled Ambulance.

bulance while the poles are attached to the sides of the vehicle by a special mechanism.

The ambulance complete with accessories, exclusive of the litters, weighs about 500 kilos; it accommodates 4 patients lying and 1 seated, or 5—and in urgent cases—7 seated.

The supplies, comprising material for 50 beds and all that is needed for the establishment and conduct of a hospital, are carried in nine 2-horse vehicles; 2 surgical wagons, carrying medicines, surgical instruments, apparatus, dressings, etc.; 1

baggage wagon for the personnel of the hospital; 6 baggage wagons for the remainder of the supplies.

Total weight of each wagon, loaded, about 1020 kilos or total weight of the entire hospital, including the wagons, about 10,000 kilos.

In addition to the sanitary supplies attached to the staff and at the depots, the *combatant* forces are equipped as follows:

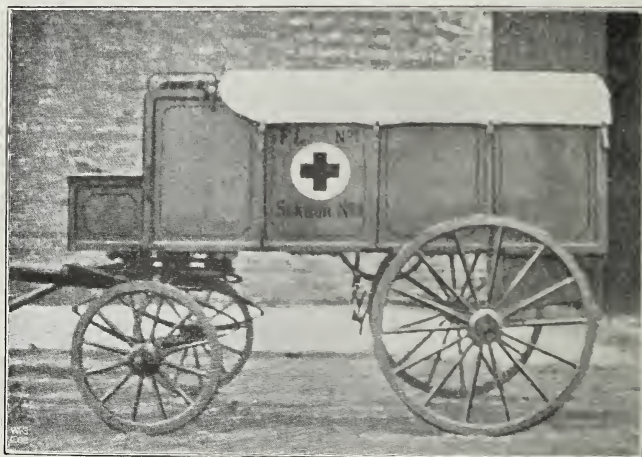
ENGINEERS.

For each company: 1 hospital pouch; 2 litters.

ARTILLERY.

LIGHT ARTILLERY.

For each battalion: 1 4-wheeled ambulance; 8 litters.



Hospital Baggage Wagon.

For each battery: 1 hospital pouch; 2 litters.

MOUNTAIN ARTILLERY.

For each battery: 1 hospital pouch; 2 litters.

COAST ARTILLERY.

For each company: 1 hospital pouch; 2 litters, plus the equipment of the sanitary service stationed at fortified places.

CAVALRY.

For each regiment: 1 4-wheeled ambulance; 8 litters.

For each squadron; 1 pair sanitary saddle-bags.

INFANTRY.

For each battalion (of about 800 men): 1 surgical wagon; 1 two-wheeled ambulance, drawn by a single horse, assisted if necessary by another horse tandem.

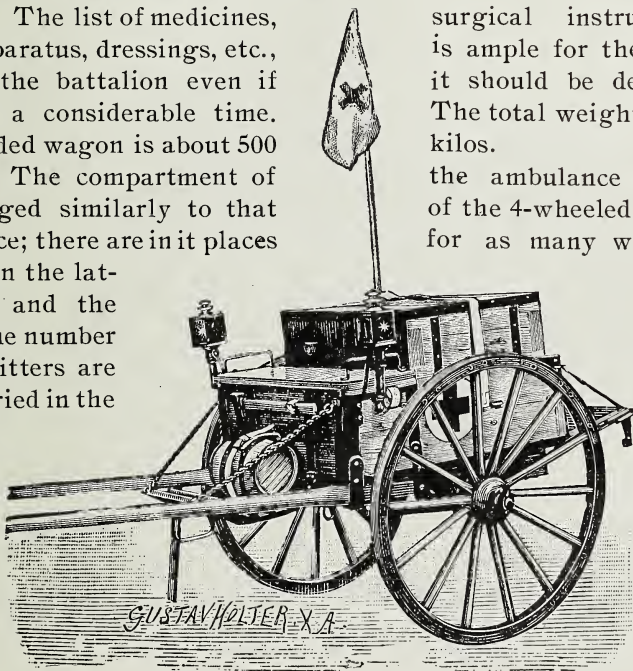
Each surgical wagon carries five cases containing all the supplies necessary for treating the sick of the battalion or for establishing a first aid station.

The list of medicines, apparatus, dressings, etc., of the battalion even if for a considerable time. loaded wagon is about 500

The compartment of ranged similarly to that lance; there are in it places as in the latter and the same number of litters are carried in the

surgical instruments, is ample for the needs it should be detached The total weight of the kilos.

the ambulance is ar- of the 4-wheeled ambu- for as many wounded



Two-wheeled Surgical Wagon.

same manner as has been described in connection with the 4-wheeled ambulance. The total weight of the 2-wheeled ambulance loaded (including the mattresses, etc., but without the litters) is about 320 kilos.

MILITARY TRANSPORTATION CORPS.

For each company: 1 hospital pouch; 2 litters.

THE LITTER.

The litter is separable and comprises canvas, end pieces and poles. The poles are of pine, young and straight, provided with brass sheathing; the end pieces are of plane wood and consist of two feet between which extends a plain cross-piece; along the upper borders there are brass buttons for



Two-wheeled Ambulance.

fastening the canvas. The canvas is strong and of a brown color, and has at one end a pillow case to be stuffed with hay, straw, etc.

Each part of the litter is so constructed as to be interchangeable with those of other litters, *i. e.* any two poles, two end pieces and a canvas will combine into a litter with equal accuracy and ease.

The litter is also "common," *i. e.* it goes equally well in

the wagons of the sanitary service or in the railway cars so as thereby to avoid the transfer of a patient from one litter to another.

The weight of the litter is 7.5 kilos; it is very solid and may be handled, mounted and dismounted with facility.

THE IMPROVISED SANITARY TRAIN

is furnished with suspension apparatus according to the French system, but a little more spacious so as to take in the litter which is somewhat larger than the French litter.

STORAGE ESTABLISHMENTS OF THE STATIONS OF THE SANITARY SERVICE.

The equipment of these establishments is based essentially upon the temporary hospitals and on the movement of the scene of hostilities.

PERSONAL EQUIPMENT.

For officers: 1 shoulder insignia; 1 dressing case.

For sub-officers: 1 shoulder insignia; 1 portable lantern; 1 knife.

For corporals: 1 dressing pouch; 1 small canteen; 1 portable lantern; 1 knife.

For privates: 1 knife.

The bearers are also equipped at the present time with a sword-bayonet, until it can be replaced by a short sword with a saw-tooth back.

Officers and sub-officers wear the sabre.

The personnel of the sanitary service is also armed with a revolver. The combatant soldiers do not carry a first dressing packet but dressings are to be had in great abundance from the dressing material and equipment of the personnel of the sanitary service.

THE BEAUMONT MEMORIAL AT FORT MACKINAC.

THE interest in original investigation so earnestly fostered in the army medical department of late years is not of recent date. Many military medical officers have struck out along new lines and brought new discoveries

to light. Conspicuous among these was Surgeon William Beaumont of the United States Army whose experiments upon the function of digestion conducted by means of a gastric fistula



The Beaumont Memorial at Fort Mackinac.

in the person of Alexis St. Martin, added greatly to the scientific knowledge of the third decade of the nineteenth century. His memory was honored by the attachment of his name to

the Beaumont Medical College in St. Louis, where he continued the practice of medicine after resigning from the army, and now the great series of experiments, by which he abundantly enriched human knowledge and immortalized his name, has been commemorated by the erection, upon the site of his experiments, of a massive trophy in enduring granite. The Beaumont memorial number of the *Physician and Surgeon*—to the Editor of which the JOURNAL is indebted for the illustration of the monument,—contains a symposium upon the life, career and work of Dr. Beaumont, which is of particular interest because of the picture it furnishes of the great investigator whom it commemorates. The monument bears the following inscription:

NEAR THIS SPOT
DOCTOR WILLIAM BEAUMONT
U. S. A.
MADE THOSE EXPERIMENTS UPON
ALEXIS ST. MARTIN
WHICH BROUGHT FAME TO HIMSELF
AND HONOR TO AMERICAN MEDICINE.

THE ASSOCIATION OF MEDICAL OFFICERS OF THE ARMY AND NAVY OF THE CONFEDERACY.

THOSE of our members who attended the St. Paul meeting will remember the pleasant interchange of courtesies, by telegraph, between our Association and that of the Medical Officers of the Confederacy in session on the same date at Memphis, Tenn. Col. John M. Keller, then President of that Association, joined ours in 1899 when Surgeon General of Arkansas. This year the Confederate Association met in Dallas, Texas, April 22–25, under the Presidency of Dr. D. D. Saunders of Memphis.

The *Southern Practitioner*, edited and published at Nashville, Tenn., by Dr. D. J. Roberts, is the organ of that association. From a recent article the interesting historical fact is noted that in January 1863 the first number of "*The Confederate States Medical and Surgical Journal*," a medico-mili-

tary monthly under the auspices of the Surgeon General appeared and was issued regularly ending with the number for February, 1865 when the war was about to close. The subscription price, at first \$10, was later advanced to \$20. A file preserved in the Library of the Surgeon General's Office at Washington shows that though issued under serious difficulties, it was an able and most useful journal. It also appears that in August, 1863 at Richmond, Va., "The Association of Army and Navy Surgeons of the Confederate States" was organized under the presidency of Dr. S. P. Moore, formerly of the U. S. Army and then Surgeon General of the Confederate Army.

The present "Association of Medical Officers of the Army and Navy of the Confederacy," largely historical in character, was organized in 1874.

All ex-medical Officers of the Confederate Army and Navy are now under the amended constitution, eligible to membership in our Association and will be cordially welcomed.

A MAJOR-GENERALCY FOR SURGEON GENERAL STERNBERG.

THE sentiment of the Association of Military Surgeons has long been strongly disposed toward the advancement of the surgeon-generalcy of the army to a grade commensurate with the authority and responsibility incumbent upon the office. In none of the great powers does the senior military medical officer rank so low as in the United States. In Great Britain and in Norway, the surgeon general has the rank of Lieutenant General, while in our own navy the surgeon general may attain the rank of senior Rear Admiral—equivalent to Major General—as did the distinguished predecessor of the present accomplished surgeon general of that service. The duties incumbent upon the surgeon general of the army, the responsibilities inherent in his office, and the actual command exercised by him in the medical and hospital corps are materially more extensive than those exercised by a briga-

dier-general of the line and exceeded by few major-generals.

During the Spanish war and the consequent Philippine operations, the work of the Surgeon General increased by leaps and bounds. New problems of vital importance arose in rapid succession only to be solved with prompt judgement and uniform success. Original work of great proportions was demanded of the office and the demand was unhesitatingly met. With a high ideal of scientific acquirements the Surgeon General fostered in his corps an activity along professional lines which has achieved results of incalculable value to humanity. The practical and potentially entire extirpation of yellow fever is but one of many scientific and humanitarian acts rendered possible by his devotion to duty in its broadest and highest sense. With executive capacity of the soundest type his administration of the enormous business affairs of his office has been characterized by exceptional sagacity and skill, while the military phases of his command have continued to progress with cumulative advantage to the service. General Sternberg's incumbency of the surgeon-generalcy indeed has been continuously marked by lofty aims and results so beneficial to the army and to the country that his promotion to the grade of major general prior to his retirement for age would be but a slight recognition of his worth.

RESOLUTIONS BY THE ARMY MEDICAL LYCEUM OF
MANILA CONCERNING THE LATE COLONEL
BENJAMIN FRANKLIN POPE, U.S.A.

THE Army Medical Lyceum announces with profound sorrow and regret the death of its distinguished President, and promoter, Colonel Benjamin F. Pope, Assistant Surgeon General, U. S. Army, Chief Surgeon, Division of the Philippines.

Colonel Pope was always a courteous gentleman and an efficient medical officer in its broadest sense, and as such enjoyed the distinction of a long and honorable career in the public service of his country, to which he devoted the best ef-

forts of his life, ever mindful of his trusts, cheerful in his demeanor, kind and considerate to his subordinates, and ever diligent in the performance of his duties. Death sought and claimed him in the midst of his labors at the very forefront of duty.

RESOLVED, that the Medical Officers of the Division and Army Medical Lyceum can pay no greater tribute to the memory of their departed Chief and comrade than to state that so long as integrity, honor and noble manhood are to be admired, so long will his name remain treasured in the hearts of those who knew him best.

FURTHER RESOLVED, that the expression of this sentiment be inscribed upon the records of the Army Medical Lyceum, and copies transmitted to the bereaved family and the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

Committee:

L. M. MAUS,

Lieut. Col., Deputy Surgeon General, U.S. Army.

L. W. BRECHEMIN,

Major, Surgeon, U.S. Army.

J. M. KENNEDY,

Major Surgeon, U.S. Vols.,

ROBERT T. OLIVER,

Examining and Supervising Dental Surgeon, U.S.A.

Manila, Philippine Islands, February 27, 1902.

A RARE AND EARLY BOOK ON THE WORK OF THE MEDICAL DEPARTMENT OF THE NAVY.*

THIS volume, a small octavo, was met with too late for inclusion in the scanty and hastily collected list of works of naval medical authors—which no doubt is still very incomplete,—in my brief sketch of the naval medical corps. The work of Cutbush antedates that of

**Observations on the Means of Preserving the Health of Soldiers and Sailors, and on the Duties of the Medical Department of the Army and Navy, with remarks on Hospitals and their internal arrangement.* By EDWARD CUTBUSH, M. D., of the Navy of the United States, Philadelphia, 1808.

Barton by several years. Its author was appointed a surgeon in the Navy in 1799 and appears to have resigned in 1829. We learn from his preface that he was "attached to the militia of Pennsylvania in 1794, first as hospital surgeon, then as surgeon-general." The book is simply and modestly written, professedly a *résumé* from French and English sources reinforced by personal experience, and eminently practical,—e.g. considerable space is devoted to recipes for various foods for the sick, especially those prepared impromptu from scanty materials. Even under present conditions, there is much that is of interest and applicable to the camp and the ship.

GEORGE PERLEY BRADLEY.

THE "AMES BOARD"—A CORRECTION.

THE modified litter described on another page of this volume* under the name of "the Mahan Board," the author wishes to state, was designed by Surgeon Howard E. Ames, U.S.N., who made the first one on the U.S.S. Montgomery in 1893, since which time he has continuously employed the board method of handling the disabled. In view of this fact, Passed Assistant Surgeon Carpenter would change the name given this apparatus in his article to "the *Ames Board*," by which he refers to it in his latest paper on "The Duties of the Medical Department at 'General Quarters'."

COPIES OF THE THIRD VOLUME OF THE PROCEEDINGS OF THE ASSOCIATION WANTED.

THE supply of the third volume of the Proceedings of the Association in the custody of the Treasurer having been exhausted, members or others having copies of that volume, of which they are willing to dispose, are requested to notify the Editor of the Journal.

**Journal of the Association of Military Surgeons of the United States*, vol. x, p. 432.

Reviews of Books.

SURGICAL EXPERIENCES IN SOUTH AFRICA*

THIS is one of the most valuable contributions to military surgery that we have seen. The modesty of its title is only surpassed by the value of its contents, for it is a carefully collated and intelligently executed work on Military Surgery and its character would have been much better indicated to the student had it been called: *Military Surgery as Illustrated by Observations in South Africa, 1899-1900*. The text is divided into twelve chapters treating respectively of (1) Introductory matters, including transportation; (2) Modern Military Rifles and their Action; (3) General Characters of Wounds inflicted by Bullets of Small Calibre; (4) Injuries to the Bloodvessels; (5) Injuries to the Bones of the Limbs; (6) Injuries to the Joints; (7) Injuries to the Head and Neck; (8) Injuries to the Vertebral Column and Spinal Cord; (9) Injuries to the Peripheral Nerves; (10) Injuries to the Chest; (11) Injuries to the Abdomen; and (12) On Shell Wounds. It is beautifully illustrated with a hundred and twenty one engravings, twenty-five of which are full page plates and ninety-six intercalated in the text, all constituting probably the most extensive and instructive series of engravings illustrative of gunshot wounds ever given to the profession in a single collection.

He notes the fact that the introduction of small calibre bullets has robbed wounds of the joints of much of the importance they possessed in earlier days and that during the South

**Surgical Experiences in South Africa, 1899-1900*, being mainly a clinical study of the nature and effects of injuries produced by bullets of small calibre. By GEORGE HENRY MAKINS, F. R. C. S., late one of the Consulting Surgeons to the South African Field Force. 8vo, pp. xvi, 489. 121 illustrations. London, Smith Elder & Co., 1901.

African campaign they were little more to be dreaded than uncomplicated wounds of the soft parts alone; no more striking evidence, he remarks, of the aseptic nature of the wounds and the harmless character of the projectile as a possible infecting agent, than that offered by the general course of these injuries, is to be found in the whole range of military surgery. Not less important than the localized character of the bone lesion itself is the fact that the accompanying wounds of the soft parts retain the small or type forms. Thus he occasionally observed more troublesome results from minor shell wounds in the neighborhood of joints but not implicating the synovial cavity than in actual perforating injuries produced by bullets of small calibre.

With regard to wounds of the abdomen he remarks that perhaps no chapter of military surgery was looked forward to with more eager interest than that dealing with the treatment of these injuries; in none was greater expectation indulged in with regard to probable advance in active surgical treatment and in none did greater disappointment lie in store. Wounds of the solid viscera it is true proved to be of minor importance when produced by bullets of small calibre; but wounds of the intestinal tract, although they showed themselves capable of spontaneous recovery in a certain proportion of the cases observed, afforded but slight opportunity for surgical skill, and results generally deviated but slightly from those of past experience. Such success as was met with depended rather on the mechanical genesis and nature of the wounds than upon the efforts of the surgeon, and operative surgery scored but few successes. The difficulties of operating under absence of modern operative refinements scarcely alone accounted for the want of success attending the active treatment of wounds of the intestines when occasion demanded. Failure was rather to be referred to the severity of the local injury to be dealt with or to the operations being necessarily undertaken at too late a date. Many fatalities again, were due to the association of other injuries, a large proportion of the wound tracks involving other organs and parts beyond the boundaries of the additional cavity. Such favorable re-

sults as occurred in abdominal injuries were practically limited to wounds caused by bullets of small calibre and, while a few cases are on record of recoveries from visceral shell wounds, the author never met with a penetrating visceral injury from a Martini-Henry or large sporting bullet which did not prove fatal.

He considers the primary field dressing of importance and describes the first field dressing of Cheatle consisting of (1) a paste contained in a collapsible tube and made up in the following proportions: mercury and zinc cyanide grs. 400, tragacanth in powder gr. 1, carbolic acid grs. 40, sterilized water grs. 800; (2) sufficient bicyanide gauze and wool for the dressing of two wounds; (3) a bandage and four safety pins; (4) the whole enclosed in a mackintosh bag. The paste possesses the advantage over any liquid or powder, that it can be applied in any position of the body to severe wounds and its application in the open air is not interfered with by draughts of wind.

Upon arrival at the field hospital the wounds were commonly re-dressed, after cleansing with a solution of perchloride of mercury or of carbolic acid, with a dressing of double cyanide of mercury and zinc, covered by a pad of wool and secured with a bandage. He thinks the bicyanide gauze, absorbent wool and common open-weave bandages together with a good supply of nail brushes, soap and carbolic acid for the primary disinfection of the skin and the external wound, are not to be greatly bettered at the present day as materials for the first permanent dressing of cases in the field. The one desirable improvement is some mode of ensuring the dressing being kept in good position, and for this some form of adhesive covering for the gauze and wool should be devised. The first dressing in the field hospital, he impressively urges, seals the fate of the wound as to the chances of primary union, and hence too much care is impossible with it.

Many other features of the book are worthy of quotation, for its value and interest becomes increasingly evident upon closer inspection. but they must be examined in the work itself which may well be in the hands of every military surgeon,

JAMES EVELYN PILCHER.

MOSQUITO BRIGADES.*

I.

IN THIS little work, the well-known author confines himself closely to the subject indicated in the title. It is not a treatise on mosquitoes and mosquito-borne diseases, but simply a manual for conducting a successful campaign against the insect enemy. As stated in the preface, it is based upon the author's experience gained during many years' study of mosquitoes in various parts of the world and more especially upon the actual results of the operations now being carried on in West Africa by the Liverpool School of Tropical Medicine. It is not written only for medical men in the tropics, but for any one who lives in a country where mosquitoes abound.

First describing briefly the varieties of mosquitoes of pathogenic importance, their breeding places and the way to find and distinguish the insects and their larvæ, the author takes up the appointment of the Commandant or Superintendent of the Brigade and the organization of the force which he divides into the *Culex* and the *Anopheles* gangs. He then gives, in detail, the duties of these men in the destruction of larvæ and adult mosquitoes and especially the removal and prevention of all collections of standing water, in which only they can breed, and the apparatus and material needed. He touches but briefly on other measures for opposing the enemy, such as the use of screens, &c. The author's motto is, "No stagnant water," which, he thinks "will shortly become the first law of tropical sanitation,"

As immediate action is always important he advises that municipal aid should not be waited for, but that means for the first attacks be obtained from public spirited individuals, trusting that the success of the early efforts will arouse the interest of the whole community and thus secure governmental support.

**Mosquito Brigades and How to Organize Them*, By RONALD ROSS, F.R.C.S.&c., Major Indian Medical Service, retired; Lecturer at the Liverpool School of Tropical Medicine. 8vo, pp. 100, New York, Longmans, Green & Co. 1902.

The appendix, containing "a history of the war against mosquitoes" in various countries, is of great interest and value as showing the wonderful results that have already been accomplished in the diminution of disease by the destruction of these insects. The work in this direction in Sierra Leone and other British colonies in West Africa, under the auspices of the Liverpool School of Tropical Medicine, has been highly successful, as also in Hongkong and other points under British control in China. The brilliant victory won over Yellow Fever in Havana by the U. S. sanitary forces is duly chronicled and Dr. Doty's campaign against malaria in Staten Island referred to.

The measures advocated by Major Ross in this book will not be novel to those already engaged in like work in this country, but his instructions are so methodical, concise and lucid and so thoroughly cover the ground, that the work cannot fail to be of much service to any one, either professional or lay, who is about to take up the fight against mosquitoes.

C. H. ALDEN.

II.

DR. ROSS, who was the first to demonstrate the passage of the malarial parasite from the stomach of the infected mosquito into the salivary gland, and to whom medical science is indebted for the identification of the species of the malaria-bearing mosquito, has recently been in charge of an experimental campaign against mosquitoes in the reduction of malaria in West Africa, and speaks with authority on the subject of which he writes. As its title indicates, the purpose of the book is to show the most modern and efficient methods of waging war against mosquitoes.

The first section of the book is devoted to an enumeration and consideration of various facts in the life-history of mosquitoes, a knowledge of which may be applied to their destruction. Popular misconceptions with reference to these insects are corrected, and the character of the breeding places of *Culex* and *Anopheles* is described.

In the second section of the book advice is given with re-

gard to the raising of funds to prosecute the work, the organization and distribution of work of the *Culex* and *Anopheles* "gangs", and the destruction of larvae and adults. To the latter, however, he believes little attention need be paid if the breeding-places are properly attacked. Dr. Ross does not by any means regard the extermination of mosquitoes from any given locality as practicable, but he does believe that such great reduction may be accomplished in the number of these insects as to practically stamp out locally the diseases which they transmit. The proof of the truth of this idea has recently been furnished by the elimination of yellow fever from Havana by measures directed solely against the mosquito. In an appendix, Dr. Ross gives a summary of the results of the warfare against mosquitoes as carried on, among other places, at Staten Island and Havana. A note of sarcasm against popular ignorance, indifference and inertia runs through the several pages, and it is easy to see that the writer's patience has been sorely tried by the slowness with which British officialdom grasps and acts upon new ideas.

The book is well written in a popular style, is free from unnecessary material and diffuse generalities, and furnishes in compact form much information of which the municipal health officer, army surgeon, or in fact everyone living in a mosquito infected district should be possessed. E. L. MUNSON.

THE DIAGNOSTICS OF INTERNAL MEDICINE.*

THE need of a complete and reliable treatise on diagnosis has long been felt by the medical profession. The successful accomplishment of the work has demanded a type of mind, compounded of the analytic and synthetic, so rare that the vacancy has hitherto remained unfilled. The superb volume of Dr. Butler, however, has fully met the demand. The subject is discussed under two general heads, (1)

**The Diagnostics of Internal Medicine.* A Clinical Treatise upon the Recognized Principles of Medical Diagnosis. By GLENTWORTH REEVE BUTLER, A.M., M.D., 8 vo. pp. xxviii, 1059. 224 illustrations. New York, D. Appleton & Co., 1901.

the evidence of disease and (2) diagnosis, direct and differential, of individual affections. The former comprises (*a*) a brief consideration of the clinical anatomy and physiology of various organs and systems, with practical points of every day utility; (*b*) a description of the approved methods of examination bearing constantly in mind the fact that the basis of the art of diagnosis is a thorough knowledge of clinical methods; (*c*) a careful consideration of the many signs and symptoms encountered in the practice of internal medicine; (*d*) a statement of the diagnostic significance of each sign and symptom, —*i. e.* the disease or diseases, the presence of which is more or less strongly suggested by the finding of a given sign or symptom. The second part comprises (*e*) a systematic series of succinct descriptions of recognized diseases and their symptoms, with (*f*) special reference to the diagnosis, direct and differential, of each disease. The two parts are thus complementary, which the author illustrates by stating that, "if in Part I it is stated that the finding of a persistently rapid pulse may be explained by the presence of exophthalmic goitre; or of a dry tongue and an inordinate thirst, by diabetes, one can turn to Part II and compare his case with the symptom group of the disease in question. Conversely, when in part II a high-tension pulse is mentioned as a symptom of angina pectoris, or Kernig's sign of meningitis, a reference to Part I will discover the method of estimating high tension or of eliciting Kernig's sign."

Introductory to the treatise proper, the author furnishes a "Synopsis (or Schedule) of examinations, constituting an order of procedure, and a symptom-guide." This consists of three parts, (I) the History or Anamnesis, (II) the General Examination, and (III) the Special Examinations. In connection with each point mentioned in the schedule, the page of the book upon which it is discussed is stated,—the combination forming an *ensemble* of the highest advantage to the student and practitioner.

With his mastery of classification and condensation and his felicity in expression it has been possible for the author to

compress the adequate treatment of a vast range of subjects within the covers of a single volume. The more recent phases of professional study are as amply treated as are the older features. Hæmatology is fully considered and the agency of the mosquito in transmitting the plasmodium malarie well developed; the more recently demonstrated agency of the stegomyia fasciata in transmitting yellow fever will doubtless find its place in the next edition, the demonstration having been too recently made to permit of its introduction in the edition now under consideration. The participation of microorganisms in the development and clinical course of disease is excellently brought out. In fact nothing which might be of advantage in identification of the internal affections to which humanity is heir is omitted.

The illustrations demand particular mention. Not only profuse in amount and exceptionally interpretative of the text, they also possess an artistic quality as unusual in other medical works as it is commendable in this. The use of a thin but opaque paper has made it possible to compress the 1078 pages of which it is composed into the limits of a volume convenient to handle and easy to consult. JAMES EVELYN PILCHER.

PARK'S SURGERY.*

THE third edition of Park's Surgery, replacing the earlier editions in two volumes is almost an entire new book. The additions and changes are numerous and extensive and have been made necessary by the rapid advance in methods of operating and improved means of diagnosis, thus increasing the value of the volume as a text-book, and a work of reference.

Sixteen of the chapters are by the editor, presenting some of the most important parts of the work in his very lucid style. The chapters on surgical pathology are complete and those

*A Treatise on Surgery by American Authors for students and Practitioners of Surgery and Medicine. Edited by ROSWELL PARL, A. M., M. D. Third Edition. 8vo. pp. 1408. 756 illustrations. Philadelphia, Lea Brothers & Co., 1901.

on inflammation are treated from the modern view of bacteriology. A new chapter on the surgical pathology of the blood, with illustrations of the different corpuscles is added; the necessary information as to their value in different diseases and operations outlined.

The auto-infection of surgical patients receives due consideration as do the surgical fevers and septic infections. The chapter on shock and collapse is brief, yet it contains, in the few pages allotted to the subject, all that other works on surgery contain and much more clearly stated. The author seems radical in his views of amputation of tuberculous extremities, whether he is justified is a question for the reader to decide.

The chapter on gunshot wounds by Major Nancrede, is brought up to date and includes reports and cases from the Cuban and South African wars. The effect of the modern bullet on the different tissues is fully described. Asepsis at the time of the first examination and dressing is rigidly insisted upon. The treatment of wounds of the different regions is noted and commented upon generally and attention called to the treatment of special wounds. Immediate operation is urged in penetrating wounds of the abdomen in civil practice, and attention called to the great mortality of immediate operation in military surgery. The treatment in full of these wounds is given under the appropriate heading in regional surgery.

In chapter XXVI written by the editor, he gives his views on the parasite origin of malignant tumors, as well as those of Cohnheim. The whole subject is treated in a dispassionate and temperate manner. An unique feature of the book is, under the heading of injuries and diseases of the lymphatic vessels a series of diagrams of the entire lymphatic system, showing the regions drained into each group of nodes. The deeper structures showing in red and the superficial in black. The revision of the chapters on fractures and dislocations is by the editor and is as complete on fracture as one could desire in a general work of the character. The chapter on dislocation is brief, but contains all that is necessary, except for the student.

Part VI. is devoted to special or regional surgery. This

to the general operator is the most important part of the work. The space devoted to diseases of the eye and ear might well have been left to the special works on these subjects as they are somewhat sketchy and generally unsatisfactory for reference. The chapter on abdominal surgery by Richardson, while enumerating the different methods of intestinal anastomosis, might well have included Maunsell's method of enterorrhaphy; it is easy, simple, and if not safer, at least as safe and as quickly done as any of the methods named. The chapter on hernia is clear and lucid, well illustrated and leaves nothing to be desired. The chapter devoted to amputations gives the latest and best methods of operating, the illustrations showing the most desirable lines for incision.

The editor and his able corps of authors have produced a work that has ranked as a standard in the past and with this revision, have so increased its value that it will be hard to surpass their present effort. As a specimen of bookmaking it reflects great credit on the publishers. A. R. ALLEN.

INJURIES OF THE BRAIN AND ITS MEMBRANES.*

ALTHOUGH of the greatest practical importance, the division of cerebral surgery comprising the injuries which the brain suffers from external violence, has received the least careful attention. This deficiency, Dr. Phelps undertakes to supply in the handsome work before us. He believes that a concise and systematic exposition of these injuries will not only be of interest to surgeons, but that it will meet the requirements of general practitioners in whose experience such injuries are infrequent, and who in exceptional instances have urgent need of the aid to be derived from a wider clinical observation than their own opportunities have permitted. The work is based essentially if not exclusively upon observations of five hundred consecutive cases of recent occurrence,—three hundred of which are quoted in condensed

**Injuries of the Brain and its Membranes from External Violence*, with a Special Study of Pistol-Shot Wounds of the Head in their Medico-Legal and Surgical Relations. By CHARLES PHELPS, M.D. Second Edition. Svo. pp. xiv, 602. 49 illustrations. New York, D. Appleton & Co., 1900.

form at the conclusion of the book,—and a large number of necropsies and cadaveric experiments. Preceded by a succinct but comprehensive preliminary consideration of cranial fracture, he discusses the subject in its general aspect in six chapters, one devoted to pathology, two to symptomatology, one each to diagnosis and prognosis, and one to the principles of treatment. A second part of the work is occupied with pistol-shot wounds of the head which are first considered in their medico-legal relations and then in their surgical relations. The third portion of the book is concerned with reports of cases, two hundred and twenty-five of which were fatal and verified by necropsy and seventy-five of which culminated in recovery in which of course necropsy was impossible. In pistol-shot wounds, the author believes that the bullet, left by necessity or choice within the cranial cavity is usually septic, and necrotic changes ensue with constitutional infection; in the comparatively small number of cases, where it is aseptic, it may become encysted when it may be harmless or more probably the source of dural or cerebral irritation at a perhaps distant period. The ultimate result of a critical analysis of all available records, is that the cause of death in intracranial pistol-shot wounds has ordinarily been the same, whether or not operative interference has been made; and that the percentage of recovery has been greater when operation has been performed. If allowance were made for the number of cases in which sepsis was declared prior to operation, or in which other antecedent conditions made interference practically hopeless, the statistical advantage of operation would become very decided.

TYSON'S PRACTICE.*

THE single volume treatise has a most important position in the armamentarium of student and practitioner alike. The comprehensive system and the exhaustive cyclopedia stand in dignified seclusion upon the library

**The Practice of Medicine.* A Textbook for Practitioners and Students with special reference to Diagnosis and Treatment. By JAMES TYSON, M.D. Second Edition. Imp. 8vo p.p. 1222. 124 illustrations. Philadelphia, P. Blakeston's Son & Co., 1901.

shelves as courts of appeal when the entire body of knowledge upon a given subject is desired. But the single volume is the key with which the student is enabled to unlock the storehouse of medical information and by which, on the other hand, the practitioner is enabled constantly and with little exertion to keep before him the main lines of professional thought and scientific conclusion,—an instrument always at hand and ever ready for application.

In its adaptation to this important function Professor Tyson's work takes a high place. The scientific facts, as would be expected from a writer of the author's wide experience and high scholarship, are accurate and up to date. The text, formed and elaborated by many years of successful teaching, is clear, direct, concise and comprehensive. Tropical diseases, an acquaintance with which the recent extension of our national interests has rendered of vital importance to many practitioners, are not conspicuously present although many of them are well brought out. The mosquito origin of yellow fever is fully discussed and the conveyance of infection by the *Culex* described, but the extirpation of the disease by the coal oil treatment of stagnant water breeding places of the intermediate insect host, which was so marvelously demonstrated by Major Gorgas in Havana, is not touched upon, owing doubtless to its recent employment. The author's use of both the metric and the English system of weights is an especially commendable move in the right direction, a feature of the work which will appeal with especial weight to the army medical officer who is officially required to use the decimal system in his work. The conversion tables at the end of the book are particularly serviceable in connection with this fact.

THE PERPETUATION OF GRAY.*

GENERATION after generation of medical infants continue to be nourished upon the anatomy of Gray and none of the innumerable rivals for the favor of student or practitioner seem to have been able to interfere

**Anatomy, Descriptive and Surgical.* By HENRY GRAY, F. R. S. Revised American from the 15th English Edition. Imp. 8vo. pp. 1257. 780 illustrations. Philadelphia, Lea Brothers & Co., 1901.

with its perennial absorption. The original book was surpassingly adapted to the wants of the profession not only because of the clear statements and logical arrangement of the author but equally if not more because of the wonderfully instructive work of the illustrator. So much indeed of the credit for the utility of the book lies at the door of Mr. Carter who drew the original plates, that it is to be regretted that his name has been dropped from the title page. To keep abreast of the progress of the science it has been necessary, from edition to edition, to introduce new plates from other hands which only go to emphasize the superiority of the drawings of Mr. Carter. Nevertheless the new engravings, of which 231 have been added in the present edition have vastly increased the value of the book. Indeed a careful scrutiny reveals evidences in every part of the work of detailed revision, which has brought the text into full harmony with the most recent knowledge of the subject. Cerebro-spinal anatomy, as would be expected, presents evidence of the greatest amount of correction but no division of the subject has escaped the scholarly attention of the revisers.

THE STANDARD MEDICAL DIRECTORY.*

THERE is much that is attractive in this handsome volume. The shape appeals to one who has occasion to consult such a directory frequently,—the large pages, affording room for four hundred names on each, render the location of the individuals a matter of but little difficulty. When it shall have been further improved by the addition of an index, which the publishers promise for the next edition, it will most excellently fulfill its function.

**The Standard Medical Directory of North America, 1902*; including a Directory of Practicing Physicians in the United States of America, Canada, Cuba, Mexico, and Central America. 4to, pp. 909, Chicago, G. P. Englehard & Co., 1902.

The Eleventh Annual Meeting.

Washington D. C., June 5, 6, and 7, 1902.

GENERAL ARRANGEMENTS FOR THE ELEVENTH ANNUAL MEETING.

THE Eleventh Annual Meeting of the Association of Military Surgeons of the United States will convene in Washington, D. C., on Thursday morning, June 5, 1902, and continue in session during the two following days. Every member is cordially urged to be present and participate in all the exercises, both social and literary.

The preparations for the meeting are in charge of an active committee composed as follows:

COMMITTEE OF ARRANGEMENTS.

Major George Henderson, N.G.D.C., *Chairman*.
Major William C. Borden, U.S.A., *Treasurer*.
Major Frederick P. Reynolds, U.S.V., *Secretary*.
Lieutenant Charles R. Luce, N.G.D.C., *Assistant Secretary*.
Major Louis A. LaGarde, U.S.A.
Medical Inspector (Comdr.) Samuel H. Dickson, U.S.N.
Surgeon Louis L. Williams, U.S.M.H.S.
Dr. George M. Kober, Georgetown University.
Captain Edward L. Munson, U.S.A.
Dr. J. Ford Thompson, Columbian University.
Dr. Wallace Neff.
Dr. Henry Alfred Robinson.

CHAIRMEN OF SUB-COMMITTEES.

Speakers—Surgeon-General George M. Sternberg, U.S.A.
Receptions—Medical Inspector S. H. Dickson, U.S.N.
Entertainments—Major Louis A. LaGarde, U.S.A.
Finance—General George H. Harries, N.G.D.C.
Press and Printing—Captain C. Fred. Cook, N.G.D.C.
Hotels—Captain C. A. Weaver, N.G.D.C.
Badges—Major James E. Bell, N.G.D.C.
Music—Captain F. J. Woodman, N.G.D.C.
Registration—Lieutenant H. B. Hollifield, N.G.D.C.

Transportation—Lieutenant B. G. Pool, N.G.D.C.

Information—Lieutenant R. A. Foster, N.G.D.C.

Halls—Lieutenant W. D. Fales, N.G.D.C.

SOCIAL HEADQUARTERS.

The social headquarters will be at the New Willard Hotel, corner 14th Street and Pennsylvania Avenue, N. W. The evenings will be given up to pleasure, which will be amply and generously provided for by the Committee of Arrangements. *It is much desired by the committee that the members of the Association be accompanied by ladies, as special arrangements will be made for their entertainment by the Ladies' Auxiliary Committee.*

PLACES AND HOURS OF MEETING.

The first session of the meeting will be held in the National Theater, June 5, at 10 o'clock, a. m. The President of the United States is expected to attend this session.

All subsequent sessions will be held in the convention hall of the New Willard Hotel at 9 a.m. and 2 p.m. daily.

EXHIBIT OF MEDICO MILITARY MATERIALS.

There will be an exhibit of Surgical Instruments and Dressings and all lines pertaining to Military Surgery and Medicine. Many of the leading houses of the United States will be represented at this exhibit.

TRANSPORTATION.

Reduced railroad rates may be obtained by persons coming to this meeting at the rate of one fare and a third for the round trip. To assure the rate, each person must purchase, not earlier than three days before the meeting, one first-class ticket to Washington, D. C., and obtain from the ticket agent a certificate to that effect. *The certificate is absolutely essential*, as the reduced rate of one-third the regular return fare will be allowed only upon the presentation of the certificate, properly endorsed, to the ticket agent in Washington.

The return fare certificate should be deposited with the Committee of Arrangements immediately upon arrival in Washington.

The Big Four Railroad System from St. Louis or Chicago to Cincinnati in connection with the Chesapeake & Ohio Railway from Cincinnati to Washington is one of the most desirable routes from the West to the

National Capital. Arrangements have been made with these lines for special sleepers through to Washington, if the number of people warrant, leaving points named on *Tuesday, June 3d.*, as follows:

St. Louis	- - - - -	12.00 noon.
Chicago	- - - - -	1.00 p. m.
Cincinnati	- - - - -	9.10 p. m.

—arriving in Washington 3.39 p. m, *Wednesday, June 4th.*

Delegates intending to come via Cincinnati will notify D. E. Holmes, City Passenger Agent C. & O. Railway, 5th and Walnut Streets, Cincinnati; those coming via Chicago, J. C. Tucker, General Northern Agent Big Four Railway, 234 Clark Street, Chicago; and those coming via St. Louis, C. L. Hillerry, Assistant General Passenger Agent Big Four Railway, St. Louis. These officers will reserve accommodations. As soon as you decide please notify the above named officials, so as to insure special sleepers.

HOTELS.

Among the hotels at which special facilities will be afforded the Members of the Association may be mentioned the following:

The New Willard, *Social Headquarters*, (European) \$2 to \$10 per day.

The Ebbitt House, *across 14th Street from the New*

Willard, (American), - - - - - \$2.50 per day

The rates given by both these hotels are much reduced.

Hotel Raleigh, (European) - - - - - \$1.50 to \$4.00 per day.

The Riggs, (American) - - - - - \$3.00 to \$5.00 per day.

Hotel Johnson, (American) - - - - - \$1.00 to \$2.00 per day.

The Regent (European) - - - - - \$1 and upward per day.

There will be a detail of non-commissioned officers in uniform at the depots on June 4th and 5th to give members and visitors such information and assistance as they may desire. Members will please notify Capt. C. A. Weaver, No. 1614 Q Street, N. W., Chairman of Hotel Committee, of the date of their expected arrival, also the number in their party.

It is the desire of the Committee of Arrangements to make this meeting one of rare excellence and enjoyment to the participants. They trust that there will be a large attendance. The delightful season of the year to see Beautiful Washington, the special railroad fares and the much reduced hotel rates, in addition to the magnificent literary program, are but few of the many notably attractive features of the 1902 meeting.

GEORGE HENDERSON,

Chairman of the Committee of Arrangements.

PRELIMINARY LITERARY PROGRAM FOR THE
ELEVENTH ANNUAL MEETING.

THE Literary Exercises at the coming meeting are already so far arranged that the main features can be announced. The Committee has received notice of fifty-six papers that will be presented on that occasion and several more important ones are known to be in preparation. The President of the Association informs the Committee that literary contributions will be made from Austria, Sweden and perhaps Germany.

Contributions will be grouped under several headings, each embracing papers on allied subjects. Under the first, "The National and State Medical Services," will be entered:

"The most practical organization for the Medical Department of the U.S. Army in active service," by the successful competitor for the Enno Sander Prize.

This essay, it is expected, will be made the basis of the principal discussion. Under the same heading will follow papers, on

"The Education of Medical Officers for the Public Service," by Med. Dir. J. C. Wise, U.S.N.

"The Qualifications and Selection of Medical Officers," by Lieut. Col. Chas. Adams, Ill. N. G.

"Character Study in the Examination of Persons for the Military Service," by Med. Dir. F. B. Stevenson, U. S. N.

"The Recruit," by Lieut. S. C. Stanton, Ill. N. G.

"Valor as an Incident of Medico-Military Service" by Major J. E. Pilcher, U.S.V.

"The Ohio Volunteers in the War with Spain," by Lieut. Col. H. M. W. Moore, Ohio N. G.

"The relations between Volunteer Aid Societies and the Public Medical Services," by Major George G. Groff, U.S.V.

Under the second heading, "Hygiene and Sanitation" there will be

Paper by Major W. C. Gorgas, U. S. A., Chief Sanitary Officer of Havana.

Paper by Lieut. Col. L. M. Maus, U.S.A. Commissioner of Health of the Philippines.

"The Prophylaxis of Certain Diseases incident to Camps in time of War," by Passed Asst. Surg. H. D. Geddings, U.S.M.H.S.

"Preventable Diseases in the Army" by Prof. G. M. Kober, late U.S.A.

"Practical Notes on Clinical Therapeutics in the Treatment of Venereal Manifestations among Soldiers of the Garrison of Vera Cruz," by Col. Z. R. Molina, Delegate from the Mexican Army.

"The Management of Small Pox", by Passed Asst. Surg. C. P. Wertenbaker, U.S.M.H.S.

"The Vaccination of Puerto Rico; a lesson to the World," by Major Azel Ames, U.S.V.

"Typhoid and Malarial Fevers at Chickamauga," by Major E. C. Carter, U.S.A.

"Anti-Typhoid Inoculations," by Dr. E. H. Wilson, Director in the Hoagland Laboratory, Brooklyn.

"The Army Cartridge Belt," by Major L. L. Seaman, U.S.Vol. Engs.

"Quarantine and its Relations to Military Operations," by Surgeon A. H. Glennan, U.S.M.H.S.

The third heading "Tropical Service and Tropical Diseases" will include papers on

"Some Practical Suggestions on Tropical Hygiene," by Major H. P. Birmingham. U.S.A.

"Tuberculosis in the Tropics" by Capt. J. J. Curry, U. S. V.

"Typhoid Fever in the Tropics," by Dr. T. C. Biddle, Topeka, Kansas.

"The Treatment of Yellow Fever, past and present," by Dr. James Carroll, U.S.A. member of the Yellow Fever Commission.

"Yellow Fever on shipboard in the Navy," by Surg. F. W. F. Wieber, U.S.N.

"The Pathology of Dysentery of Tropical Origin," by Dr. Charles F. Craig, U.S.A. Pathologist Presidio General Hospital, San Francisco.

"Experiences in Guam," by Surg. Philip Leach, U.S.N.

"Remarks suggested by Three Years Service in Cuba," by Capt. J. H. Stone, U.S.A.

"The Medical Topography of Puerto Rico," by Capt. José Lugo-Viña, P. R. Regt. U.S.A.

"The Kahuna or Witch Doctor of Hawaii," by Major B. D. Taylor, U.S.A.

"Military Surgery" will include papers on

"Gunshot Wounds of the Shoulder and Knee Joints," by Col. G. R. Fowler, N.G.N.Y.

"Practical Application of Radiography in Military Surgery at Field Hospitals," by Major William C. Borden, U.S.A.

"Some Experiences with Bolo Wounds," by Lieut. Jere B. Clayton, U.S.A.

"Note on Bolo Wounds," by Passed Asst. Surg. C. DeW. Brownell, U.S.N.

"Volvulus in its relation to Hernia," by Surg. G. T. Vaughan. U.S.M.H.S.

"A further consideration of the necessity for immediate celiotomy in penetrating gunshot wounds of the abdomen in war" by Capt. Chas. E. B. Flagg, U.S.A.

"Surgery at the New York Naval Hospital" by Surg. George Rothganger, U.S.N.

"Wounds of Nerves" by Capt. James P. Warbasse, N.G.N.Y.

"Remarks on the effects of the Luger and Colts automatic Pistols" by Major L. A. LaGarde, U.S.A.

"The Laws of Ballistics and Physics the true explanation of the Lodgment and Deflection of Modern Small Arm Projectiles, not the Ricochet Hypothesis," by Major C. B. Nancrede, U.S.V.

Under "Military Hospitals and Military Nursing" there will be papers on

"The U.S. Army Hospital and Sanitorium for Pulmonary Tuberculosis at Fort Bayard, N. M.," by Major D. M. Appel, U.S.A. Commanding.

"Hospitals and Charities in Cuba," by Major J. R. Kean, U.S.A., Supt. Dep. of Charities.

"The Medical Department of the U. S. Transport Service," by Major H. S. Kilbourne, U.S.A., Superintendent.

"The Japanese Red-Cross Society, and Red-Cross Nurses" by Col. N. Senn, Surgeon General of Ill.

"The Training of Hospital Corps Men" by Capt. F. A. Winter, U.S.A.

"The relation of Personnel to Bed Capacity in Military Hospitals," by Capt. J. S. Kulp, U.S.A.

Among the Unclassified Papers will be:

"Operation of the Medical Department at the battle of Antietam," by Col. W. H. Forwood, U.S.A.

"How can Medical Officers promote expert markmanship in the Army," by Gen. J. Francis Calef, Surgeon General of Conn., ret'd.

"Traumatic Rupture of the Choroid" by Lieut. Edward Stieren, N.G. Pa.

"The treatment of Gonorrhea in the Navy" by Passed Asst. Surg. S. G. Evans, U.S.N.

"The Military Motor Ambulance," by 1st Lieut. Clyde S. Ford, U.S.A.

"The Medical and Surgical Equipment of a Regiment for a week's tour of duty" by Lieut. Col. J. K. Weaver, N.G. Pa.

"A New Device for a First Aid Packet" by Asst. Surg. J. C. Thompson, U.S.N.

"A New Medical and Surgical Case, a substitute for the Hosp. Corps Pouch" by Capt. F. W. Hendley, Ohio N.G.

"Some of the More Important Considerations Governing the Action of the Board recently appointed to Revise the Supply Table of the Medical Department of the U. S. Army," by Capt. Edward L. Munson, U.S.A.

"The Work of the U. S. Army Medical Department in Alaska," by Major R. G. Ebert, U.S.A., late Chief Surgeon of Alaska.

"The Work of the U.S. Army Medical Department in China," by Major Frank J. Ives, U.S.A., late Chief Surgeon.

In the final program, there will be given after each group of papers, the names of Members who have agreed to take part in the discussion. Abstracts of the articles to be read cannot, unfortunately, be furnished but the foregoing list will indicate the topics to be taken up.

It is earnestly requested that writers who have not yet sent the titles of their papers will do so at once. Those who find they are unable to attend the meeting, will please send their papers to the Secretary, Major James Evelyn Pilcher, Carlisle, Pennsylvania, so as to reach him not later than May 31st, 1902.

CHARLES H. ALDEN,

Chairman of the Literary Committee.

